Technology of Learning Media for Dyslexia Children's

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Abstract. The purpose of this study was to develop a media for reading therapy for students with dyslexic learning disorders, to test the design of ABC sea sand box media for dyslexic children's reading therapy, and to describe the effectiveness of the ABC sea sandbox media for dyslexia reading therapy. Data sources in this study were teachers and dyslexic students of SDN 2 Dorokandang and SDN 3 Soditan. The results of the prototype of the sea sand box media through the making of wooden boxes and utilizing the environment of students, using sea sand as a means to write with fingers based on the theory of VAKT therapy, guidebooks use media with quality manufacturing materials and attract students' attention. After being validated by the validator, the score is 89,2 with a valid category. Then ABC sea sandbox media is applied to the experimental class and the result of N-gain calculation is 0.36 in the medium category. Obtained that tcount is 3,06. From the results of this study, it can be concluded that the ABC sea sand box can be used in the therapy of reading dyslexic children. Hopefully it can inspire teachers to innovate in other learning.

1. Introduction

Indonesia is a nation well-known for its diversity in ethnic groups, languages, religions, and cultures. Indonesian difference is the form of national wealth that is not possessed by all nations. Each ethnic group has its characteristics, whether it is tradition or culture. Poerwanto emphasizes that ethnic group diversity in Indonesia is the pride and also a concern for the Indonesian nation[1].Education is one of the determining efforts in improving the quality of human resources. Education always strives for a person's life in a better direction which is necessary for life in the future. Likewise, education is defined as something that produces individuals or students who have knowledge and have the ability to think to solve life problems at hand.

Indonesian language education is one that is taught in elementary schools. Indonesian language learning places more emphasis on reading skills.Most definitions of dyslexiaagree on primary inclusionary criteria, including marked difficulties with word reading, decoding, and spelling as evidenced by low accuracy and/or fluency on standardized assessments[3]. The goal is that students have the right knowledge of learning skills and are able to enrich their knowledge. According to Murni,[4]the purpose of reading is to seek and obtain information, including, understanding the meaning of reading. Likewise, reading also aims to absorb and understand information and ideas in

reading material, which is not an easy thing. Dyslexia thus means problems learninghow to read words and deal with language in print[5]. Therefore, elementary school students who want to gain reading progress are required to have effective and efficient reading skills and need to use appropriate reading improvement strategies.

The love of the country character is the way of thinking, acting, and doing something to show loyalty, concern, and appreciation towards language, physical environment, social, culture, and politic of a nation. The love of the country character is one of the aspects that need to be developed in elementary school as Indonesia is a multicultural country[6].

Specific learning difficulties are conditions in children who experience learning disabilities, this condition is caused by disruption of processes in the brain, which can be in the form of perceptual disorders (visual or auditory), disturbances in the integrative process, or expressive disorders[7]. There are forms of academic difficulties experienced by elementary school age children, one of which is dyslexia.Surprisingly, the problems faced by many dyslexic children are by no means confined to reading and spelling. There appears to be a general impairment in the ability to perform skills automatically, an ability thought to be dependent upon the cerebellum. Specific behavioural and neuroimaging tests reviewed here indicate that dyslexia is indeed associated with cerebellar impairment in about 80% of cases.We propose that disorders of cerebellar development can in fact cause the impairments in reading and writing characteristic of dyslexia, a view consistent with the recently appreciated role of the cerebellum in language-related skills[8].

Dyslexia thus means problems learning how to read words and deal with language in print[5]. Children with language problems often have motor problems. In a review of the literature, Hill (2001) found that most children with a diagnosis of specific language impairment also had a diagnosis of developmental coordination disorder, namely movement difficul- ties out of proportion with their general development and intelligence[9].My work has focused on a different question: Whether or not dyslexia is caused by a deficit in the magnocellular system (Skottun, 2000a, 2000b; see also Gross-Glenn et al., 1995; Skottun & Parke, 1999). Ihave pointed out that studies which have used contrast sen- sitivity to test for magnocellular deficits in dyslexic readers have largely failed to find such deficits [10].Developmental dyslexia is a failure to acquire reading skills that affects around 5% of children despite adequate. intelligence, education and social background[11]. On Researchers conducted observations at SDN 2 Dorokandang, which is one of the inclusive elementary schools in Lasem District. It is known that teaching reading of dyslexic children at PPI (Individual Learning Program) does not use interesting learning media (Observation Saturday, 11 January 2010 at 08.30 WIB). Learning to read in dyslexic children only uses textbooks to read at the beginning, not using media or attractive teaching aids. Sometimes teachers also just write a few words in a notebook and then ask the dyslexic child to read them. As a result, dyslexic children are not enthusiastic about learning, and some do not even want to learn to read.

The results of the observations also obtained information that the teacher also did not know the special characteristics of dyslexic children. Developmental dyslexia is now well established as a disorder of neurobiological origin Evidence[12]. This can be seen in learning techniques that do not pay attention to the characteristics of dyslexic children. Dyslexic children are given reading texts, then the teacher instructs them to read and spell letter by letter. The teacher asks the students to copy the writing of one sentence repeated up to one page of the book. This method is always used, it can be seen from the workbook of dyslexic children.

Departing from the character of dyslexic children who are bored with letters and reading in unattractive books, the teacher must be able to develop a learning medium, so that dyslexic children are interested in learning to read. Based on the description of the problem regarding the absence of appropriate reading therapy learning media for dyslexic children, researchers felt the need to develop reading therapy media that was in accordance with the needs of dyslexic children. The media that the researchers chose was sea sand media. This media has been adapted to the characteristics of dyslexic children who get bored easily so that this media can attract students' interest to learn because it is presented in the form of playing while learning. This media also utilizes the surrounding environment

as learning material, in which Rembang is a coastal area that is rich in marine products, one of which is sea sand.

Sea sand media is one of the media that uses multi-sensory therapy, which involves the senses of sight, touch, movement, and sound, so that children can connect letters and sounds. Start by asking the child to write a word on the sand, for example b-u-d-i. While writing, ask the child to spell each letter written aloud and aloud.

2. Methods

This study used a research and development design with seven implementation steps referring to the theory of Borg and Gall. According to Borg and Gall states that Educational R & D is based on an industrial development research model, where research results are used to design new products and procedures, and then systematically field tested, evaluated, and refined until they meet the criteria. which are specific, namely effectiveness, quality, and meet standards. This research was conducted at SDN 2 Dorokandang, SDN 3 Soditan, Lasem District, Rembang Regency. The research will be carried out in seven stages of research. The data collection instruments in this study were expert validation questionnaires, teacher questionnaire responses, student questionnaires, interview guidelines, and observation guidelines. Data collection techniques used in the research and development of pocket books based science literacy in grade V SD were observation, questionnaires, and interview guidelines. The validation analysis uses a type rating scale with the following stapes: The validator assigns a score to the statement items. The answer scores include the following categories: (4) very good, (3) good, (2) sufficient, (1) less. The total score for each validator is added up for all indicators. The results obtained are interpreted by the following criteria (Table 1).

Table 1. Criteria for the Validity of the Assessment Tool

Number	Score	Category
1	81-100%	Very Good
2	61-80%	Good
3	41-60%	Enough
4	21-40%	less
5	<21%	Very little

The teaching materials developed will be said to be suitable for use as teaching materials in learning if the percentage obtained from the validation process is more than 61%.

3. Results and Discussion

The results of research and development of ABC Sandbox media include the need for reading therapyfor dyslexia children on elementary school.

3.1. The Need for Learning Media for Reading Therapy for Dyslexic Children

The need for instructional media for reading therapy for dyslexic children in this study describes the need for developing media for reading therapy for dyslexic children which is obtained based on the results of the needs analysis for teachers and students beside the teacher's role here provides environmental, materials, media, visual aids, and designing the learning process well [13].

Based on the analysis of the needs for reading therapy media from students and teachers, the researcher will develop the ABC marine sandbox media and as the magnocellular system seems critical for capturing transient covert attention the prolonged attentional dwell time in dyslexic subjects could result from ineciency of their magnocellular system in reengaging attention when new stimuli arrive[14]. The main material requirement of this medium is sea sand. Researchers are trying to develop reading therapy media for dyslexic children, using the main ingredient of sea sand, which is not only easy to find in the Rembang area, but also because sea sand is a very appropriate medium for

implementing reading therapy methods for dyslexic children, namely the Fernald method, which develops teaching methods. multisensory or better known as VAKT (Visual, Auditory, Kinesthetic, and Tactile) (Figure 1).

Figure 1. Reading therapy use of ABC Ocean Sandbox Media

3.2. ABC Marine Sandbox Media Development

In developing this media, researchers have analyzed several components of the ABC marine sandbox media.The material for making ABC marine sandboxes is teak wood that has been varnished, then covered with a transparent sticker to protect the wooden box from scratches. Inside the wooden box there are two sides of the room, one space to put a plastic box filled with sea sand, to write letters / words / sentences that will be used for reading therapy for dyslexic children and media use manuals, the other is for a place stick to the letters of the alphabet and numbers.

The researchers deliberately chose sea sand to be used as a reading therapy medium, because besides being cheap and easy to find in the Rembang area, sea sand also has a soft texture and is not easily sticky, so it is appropriate to use as a reading therapy with the VAKT method (Visual, Auditory, Kinesthetic, and Tactile).

The average validation of ABC marine sandbox media from 2 media experts obtained 89.2% with valid predicate, so the ABC marine sandbox media was suitable for use in the learning process of reading therapy for dyslexic children.

3.3.Effectiveness of ABC Ocean Sandbox Media for Reading Therapy in Children with Dyslexia

The average experimental class after using ABC marine sandbox media was 71.66. The researcher then calculated the standard deviation with the variance value (s2) 165.65 with the deviation value (s) 12.87. Researchers also calculated the N-gain by comparing the average pre-test and post-test performance. The calculation results obtained results g = 0.36 in the medium category.Then the researcher calculated the standard deviation (S2) from the standard deviation of the control class and the experimental class in order to obtain the results. Then the researchers calculated the tcount. The t-count obtained results. Then the researchers compared with the t table. The number of control class (n1) and experimental class (n2) is 15, then (n1 + n2) - 2 = 13. The significant level a = 5%, then t table is 2.10 So $t_{count} > t_{table}$.

Based on the results of research on needs analysis, it has been obtained that in reading therapy for dyslexic children, it requires a medium that is in accordance with the characteristics of dyslexic children, and utilizes the surrounding environment for learning, according to the meaning of media according to [15], media is everything. something that can be used to transmit messages from sender to recipient so that it can stimulate students' thoughts, feelings, attention and interests in such a way that the learning process occurs. The characteristics of children with dyslexia, among others, are easy to forget, especially when things have happened, it is difficult to do more than one instruction at the

same time, which makes us as teachers have to innovate to make a medium for learning to read so that it is easily accepted by dyslexic children. One of them is ABC marine sandbox media. This media is in accordance with the VAKT (Visual, Auditory, Kinesthetic, Tactil) therapeutic approach requires all sense who have developed this method. This method uses reading material selected from the words uttered by the child as a whole. The characteristics of dyslexic children who like to play, with this learning medium are deemed appropriate for dyslexic children to play, playing while learning.This media also utilizes the surrounding environment to play it, namely sea sand. Sea sand is easily found in the blood of Rembang, which is a coastal area. The texture of sea sand is also very suitable to be used in this medium, when scratching a finger it will form a clear scratch mark.Dyslexic children really need reading therapy learning media in accordance with their characteristics, so that they will be interested in learning and not feel bored.

In this ABC marine sandbox media design, researchers analyzed the basic competencies and indicators in the Indonesian language lesson content in reading learning. The core competencies chosen are KI-4, namely skills. The basic competency reports on the use of appropriate Indonesian vocabulary or regional languages regarding the diversity of objects based on their shapes and forms in the form of written, spoken, and visual texts. Then the researchers developed indicators in the form of re-reading short texts related to the diversity of objects with pronunciation and intonation. Adjusting indicators for dyslexic children, researchers developed indicators, namely reading words related to a variety of objects fluently and with proper pronunciation. The researcher designed a modified lesson plan, then made the learning media. [16], media are people, materials, or events that build conditions with the function and purpose of making students able to acquire knowledge, skills, attitudes or educate. Learning media helps develop an atmosphere of learning and student interest in learning. The media chosen by the researchers to help liven up the atmosphere was the ABC marine sandbox media.After the media is made then validated by experts. From the first expert validation, the results obtained were 89.2 with the valid category. Revision of the media was not done totally. However, it only carries out suggestions from a few validators. The validator's suggestions are (1) The number of media needs to be adjusted to the proportion of students; (2) If possible, add colorful 3-dimensional letters in the box, not only letter and number stickers, so that dyslexic children can also hold and touch; and (3) Learning / reading therapy should be done outdoors

After obtaining the validation results, the researcher will use ABC sea sandbox media in reading therapy for dyslexic children. The effectiveness of this media is sought based on the control class and experimental class. The control class at SDN 3 Soditan without using ABC marine sandbox media in reading therapy for dyslexic children, and SDN 2 Dorokandang as an experimental class using ABC marine sandbox media in reading therapy for dyslexic children. From the results of the analysis of the performance of the control class, it was found that the average reading skills of students in reading was 49.93 with the highest score of 66.33 and the lowest score of 25. From the average calculation, the variance (s2) was 240.3 and standard deviation (s). 15.5.

In the experimental class, learning observations were made using the ABC sea sandbox media with an average of 93.33. The students were very enthusiastic and interested in using ABC marine sandbox media. When assessing reading performance, an average of 71.66 was obtained with the highest score of 83.33 and the lowest score of 58.33. The value of variance (s2) is 165.65 with a deviation value (s) of 12.87. Researchers also calculated the N-gain by comparing the average pre-test and post-test performance. The calculation results obtained results g = 0.36 in the medium category.

4. Conclusion

From the research that has been done, the conclusions that can be obtained are:

The results of the development of learning media in the form of ABC marine sandbox media answered three problems in accordance with the existing problem formulations. Namely regarding the need for instructional media for reading therapy for dyslexic children, the design of ABC marine sandbox media development for reading therapy for dyslexic children, and the effectiveness of ABC marine

sandbox media for reading therapy for dyslexic children. Overall, the results of the research are described in the following description:

1. Reading therapy for dyslexic children requires media that can accommodate the learning characteristics of dyslexic children and utilize the environment as a learning resource, so the researchers developed the ABC marine sandbox media.
2. The design for the development of ABC marine sandbox media that is carried out is by analyzing core competencies and basic competencies, then making adjustment indicators for ABK (Children with Special Needs), then conducting studies on the existing media for reading therapy for dyslexic children with those that will be developed. , validation of ABC marine sandbox media by media experts. The results of the validation by media experts obtained 89.2 results with the valid category. The components of the ABC marine sandbox that the researchers developed are natural teak wood and sea sand and the stages of reading therapy for dyslexic children through the VAKT theory approach.
3. From the effectiveness test of the control class and experimental class, the N-gain result is 0.36 in the moderate category. While the calculation of the value of tcount 3.06> ttable 2.10, so that the ABC sea sandbox media is effective in reading therapy for dyslexic children

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