

Conference Paper

The Development of Sewing Board Media to Optimize the Fine Motor Abilities of Students with Cerebral Palsy

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Abstract

Disability can be classified into two types, namely disorders of the function of the orthopedic limb (orthopedic disability) and disorders of the function of the nerve (neurological disability). The purpose of this study was to optimize the fine motor skills of students with cerebral palsy at TKLB SLB D YPAC, South Jakarta, through sewing board media. In this study, the ADDIE Approach (Analysis-Design-Develop-Implement-Evaluate) was used. The sewing board media developed in this study were shown to be effective and can be used in optimizing the fine motor skills of students with cerebral palsy.

Keywords: children with special needs, cerebral palsy, fine motor, sewing board media

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1. Introduction

The differences in each child's development will vary, knowing and understanding the developmental phases of a child can certainly help an educator optimize the learning that will be given, especially if this learning is aimed at children with special needs. These children with special needs generally have differences both physically, mentally and socially, emotionally. They have special characteristics that result in adjustments in various fields so that they continue to have the same rights as other children. The adjustment is made in order to optimize their development like other children. These adjustments can be in the form of: a learning environment that can accommodate the needs of all children, adjustment of children's academic abilities, skills and knowledge of educators in order to understand the child's condition, adjustment of learning activities, adjustment of learning facilities and infrastructure, adjustment with peers and adjustment to the community environment. These children with special needs generally have differences both physically, mentally and socially, emotionally. They have characteristics

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that result in adjustments in various fields so that they have the same rights as other children. These adjustments are made so that their development can be more optimal as is the case with other children.

Researchers are interested in developing a sewing board media that can be adapted to the conditions and needs of Cerebral Palsy (CP) students at TKLB SLB D YPAC, South Jakarta so that the goal of optimizing the movement of Cerebral Palsy (CP) students can be realized. The subjects used are Elementary Class 2 and Kindergarten Class B with almost the same fine motor skills. This research described the steps for using sewing board media in optimizing the fine motor skills of Cerebral Palsy (CP) students at TKLB SLB D YPAC, South Jakarta. The subjects used entirely were students of Cerebral Palsy (CP) SLB D YPAC, South Jakarta. Due to the Covid-19 pandemic, which required no face-to-face activities in schools, thus limiting the sample to be targeted.

2. Related Works/Literature Review

There are various types of children with special needs, one of which is children who do not have physical abilities (disabled) [8]. Disability can be classified into two types, namely disorders of the function of the orthopedic limb (orthopedic disability) and disorders of the function of the limb of the nerve (neurological disability). Orthopedic disability is a child who experiences disability, disability, and certain imperfections in his motoric body, especially in the bones, body muscles and joint areas, for example: Poliomyelitis, Bone Tuberculosis, Osteomyelitis and Arthritis. Meanwhile, neurological disabilities are abnormalities in the function of the limbs (motor disorders of the hands or feet) caused by disorders of the nervous system. One of the people with neurological disabilities can be seen in children with Cerebral Palsy (CP), which shows that physical disabilities can be classified into two types, namely disorders of the function of orthopedic limbs (orthopedic disabilities) and disorders of the function of nervous limbs (neurological disabilities). While orthopedic disabilities are children who experience disabilities, disabilities, and certain imperfections in their motoric bodies, especially in the bones, muscles of the body and in the joints. For Cerebral Palsy (CP), there is an obstacle to the nervous system in the brain during growth and development.

Cerebral Palsy (CP) is a part of neurological disabilities (physical disabilities), they also do not escape the attention and reach of educational services [7]. This is fully realized by educators who are experts in the field of Special Education because when viewed from their existence, this child with Cerebral Palsy (CP) will remain throughout human life, and the general public has not seen that children with special needs, including

children with Cerebral Palsy (CP) still has the potential that can be developed optimally so that they can live independently and do not have to burden others.

The disruption of motor function experienced by children with Cerebral Palsy (CP) will result in impaired movement and posture, mobility and motor limitations so that various difficulties will arise that affect their learning outcomes, such as: intellectual disorders, seizure disorders, communication difficulties, behavior and independence in daily activities. The emergence of this difficulty requires efforts to improve, shape and strengthen their fine motor skills so that Cerebral Palsy (CP) students can carry out a motion correctly with guidance in the form of stimulation towards the development of motion so that it can produce meaningful movements for Cerebral Palsy (CP) students.

The results of observations in the class concluded that the teacher always tries to provide assistances in optimizing the fine motor skills of Cerebral Palsy (CP) students in TKLB classes by using guidance on children's physical abilities by using simple activities that aim to strengthen joint muscles so that children's physical abilities will be more flexible and less stiff. Things to do, such as: (i) Strengthening the muscles through physiotherapy, occupational therapy, playing therapy and music therapy with the aim of keeping joint motion from being too stiff; (ii) Improving joint movements through simple playing activities such as catching the ball, playing using various light tools such as small balls and large balls, moving water using sponges, doing light exercise can help maintain the fitness of children with Cerebral Palsy; (iii) Positioning and posture such as directing the child to sit properly using an upright body position, not bending over and striving for the head to be straight, not down. This movement building activity is carried out through playing using various educational game tools (APE) to train fine motor skills, eight of which are: playing with playdough, playing with a smile, playing with a small ball, catching the ball, matching colors using color puzzles, painting using paint. water, finger painting uses watercolor and has used a sewing board media even though the results are not in accordance with expectations because the child is only limited to working and does not understand the concept of front and back when sewing on a sewing board and sewing board is there and has been used it turns out to be difficult for children, especially for children Cerebral Palsy (CP).

This fact makes researchers assume that the existing and used sewing board media is not a product of the result of the research because if it is assessed in terms of suitability, the sewing board media cannot be said to be in accordance with the conditions and needs of children with special needs, especially for Cerebral Palsy (CP) students. The reviewing process of the sewing board media used in the classroom has the following criteria: (a) has a distance between holes that are close to each other, which is about 2

cm; (b) there is a small hole size of about 4 mm; c) the number of holes varies between 10 holes to 30 holes making it difficult for Cerebral Palsy (CP) students, especially for Cerebral Palsy (CP) students of the Spastic Quadriplegia type (paralysis of the limbs in the form of two paralyzed hands and two legs) and Cerebral Palsy students (CP) with Low Vision resistance to insert the rope into the hole and pull the rope back out of the hole on the sewing board. In general, Cerebral Palsy (CP) students when playing the sewing board did not finish it because it was not interesting, bored and considered difficult.

The reason the researchers chose the sewing board media with the aim of being able to provide activities for fine motoric movements that would be assembled according to the learning theme so that students became more interested so that they could optimize the ability of movement for Cerebral Palsy (CP) students by involving the coordination of the hands and eyes and brains. The research objectives are: 1) knowing the sewing board media model that will be used in order to optimize the fine motor skills of Cerebral Palsy (CP) students so far; 2) knowing the development of the sewing board media in order to optimize the fine motor skills of Cerebral Palsy (CP) students; 3) knowing the steps for using sewing board media to optimize the fine motor skills of Cerebral Palsy (CP) students; 4) knowing the effectiveness of the sewing board media to optimize the fine motor skills of Cerebral Palsy (CP) students; 5) knowing the purpose of providing sewing board media for students with special needs, especially for Cerebral Palsy (CP) students at TKLB SLB D YPAC, South Jakarta.

3. Material & Methodology

3.1. Data

The development of the learning model used in this study is the ADDIE Approach (Analysis-Design-Develop-Implement-Evaluate) Learning Design Model. The ADDIE Approach can be developed systematically and is based on the theoretical foundation of learning design. This model is arranged programmatically with a systematic sequence of activities in an effort to solve learning problems related to learning resources that are in accordance with the needs and characteristics of students. Through the ADDIE model, there is an opportunity to evaluate the development activities of each stage.

The evaluation technique used is a non-test evaluation technique. In this research and development, researchers used questionnaire and observation techniques. The evaluation technique by distributing closed and open questionnaires was carried out

through expert reviews and evaluation techniques in the form of observations carried out during field trials to Cerebral Palsy (CP) students using a sewing board media. Expert reviews and field trials were conducted by means of one to one evaluation.

3.2. Method

3.2.1. Instrument Validity Test Results

The validity test is carried out to measure the high level of accuracy and consistency of the research instruments that have been used in data collection. To find the validity value of an item, the correlation between the item score and the item's total score is used.

The validity test was carried out to test each item of the question in the questionnaire instrument used. The validity test was conducted to test the validity of each question item in the questionnaire instrument used. The test is said to be valid if the Corrected Item Total Correlation value which is the count of each question item must be greater than the r_{table} value.

3.2.2. Instrument Reliability Test Results

The reliability test is carried out to determine whether the measurements that have been carried out produce consistent or stable answers over time. That is, the consistency of measuring instruments in producing data is called constant if the data measured by the same tool and repeatedly produce relatively the same data. The decision is made by looking at the value of Cronbach's Alpha.

3.3. Table and Figure

Before distributing research instruments or questionnaires, the data validity and reliability were tested.

3.3.1. Instrument Validity Test Results

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The criteria for making the validity test decision are summarized as follows:

The questionnaire used. The test is said to be valid if the Corrected Item Total Correlation value which is the count of each question item must be greater than the r_{table} value. The criteria for making the validity test decision are summarized as follows:

$$r_{count} > r_{table}$$

The validity test in this study was analyzed using the Degree of Freedom (df) with the formula $df = n - 2$, with a confidence pressure of 95%. The value of n shows the number of respondents examined in this study as many as 4 respondents. So that the df value is $4 - 2 = 2$. Confidence pressure is 95% and $df = 2$ then input by using the formula on the variable computer in the IBM SPSS 25 software to find the table:

$$t_{table} = \text{Inv}(\text{prob}, df) \\ = \text{Inv}(0.05; 2), \text{ then it is obtained } t_{table} = 4.30$$

Next, look for the r_{table} value by entering the df value and the t_{table} value that have been obtained into the following formula:

$$r_{table} = \frac{t}{\sqrt{df + t^2}} \\ r_{table} = \frac{4.30}{\sqrt{2 + 4.30^2}} = 0.95$$

It means the r_{table} value is obtained = 0.95. The basis for decision making (DPK) for the validity test in this study is as follows:

- a. If $r_{count} \geq 0.95$, then the question item is valid.
- b. If $r_{count} < 0.95$, then the question item is invalid.

TABLE 1: Results of the Validity Test of Hand Flexibility Indicators

Item	r correlation	r_{table}	conclusion
1	0.99	0.95	Valid
2	0.96	0.95	Valid

Based on Table 1, the validity test of the flexibility of hand movements can be said to be valid because the total score is positive and the amount is 0.95 and above and is positive, meaning that the statement to be used to measure the variable is correct.

TABLE 2: Results of the Validity Test of the Hand Eye Coordinator Indicator

Item	r correlation	r _{table}	conclusion
1	0.95	0.95	Valid
2	0.98	0.95	Valid
3	0.96	0.95	Valid

Based on Table 2, the validity test of the hand eye coordinator indicator can be said to be valid because the total score is positive and the amount is 0.95 and above and is positive, meaning that the statement to be used to measure the variable is correct.

TABLE 3: Test Results of the Validity Indicator of Accuracy

Item	r correlation	r table	conclusion
1	0.99	0.95	Valid
2	0.99	0.95	Valid
3	0.99	0.95	Valid
4	0.95	0.95	Valid

Based on Table 3, the validity test of the accuracy indicator can be said to be valid because the total score is positive and the amount is 0.95 and above and is positive, meaning that the statement to be used to measure the variable is correct.

TABLE 4: Speed Indicator Validity Test Results

Item	r correlation	r table	conclusion
1	0.99	0.95	Valid
2	0.96	0.95	Valid
3	0.96	0.95	Valid
4	0.99	0.95	Valid
5	0.99	0.95	Valid

Based on Table 4, the validity test of the speed indicator can be said to be valid because the total score is positive and the amount is 0.95 and above and is positive, meaning that the statement to be used to measure the variable is correct.

3.3.2. Instrument Reliability Test Results

The reliability test is carried out to determine whether the measurements that have been made produce consistent or stable answers over time. That is, the consistency of measuring instruments in producing data is called constant if the data measured by the same tool and repeatedly produce relatively the same data. The decision is made

by looking at the value of Cronbach's Alpha. If the Cronbach's Alpha value > from the r table value is 0.7, then the variable test is reliable.

TABLE 5: Reliability Test Results

Variable	r_{count}	r_{table}	Description
Flexibility of hand movements	0.889	0.7	<i>Reliable</i>
Hand eye coordination	0.957	0.7	<i>Reliable</i>
Accuracy	0.980	0.7	<i>Reliable</i>
Speed	0.974	0.7	<i>Reliable</i>

Based on Table 5, the test results show that all variables are said to be reliable because they are greater than 0.7. It means the variable test is reliable.

4. Results and Discussion

4.1. Results

In order to determine the comparison of the pretest, posttest and the effectiveness of the sewing board media to optimize the motion building skills of Cerebral Palsy (CP) students, this research used 4 (four) dimensions, namely the dimensions of hand motion flexibility, hand eye coordination, accuracy and speed. The recapitulation results of the effectiveness of the pretest, posttest and the effectiveness of the sewing board media to optimize the fine motor skills of Cerebral Palsy (CP) students are described in Table 1.

In the dimensions of flexibility in hand movements, the fine motor skills of each child with Cerebral Palsy (CP) have increased after using a sewing board design. This means that when using the sewing board media, each student's flexibility in hand movements does not experience progress, but after using the sewing board design each student has developed. This the sewing machine board design is very effective in the flexibility dimensions of hand motion.

4.2. Discussion

The discussion on the presentation of data is the result of analysis and facts that the researchers found in the field, has been adjusted to the theory used in this study and it can be concluded that the use of sewing board media to optimize the movement of students with special needs, especially for Cerebral Palsy (CP) students in SLB D YPAC,

TABLE 6: The average value of the recapitulation of the effectiveness of the pretest, posttest and the effectiveness of motion building to optimize the motion building of Cerebral Palsy (CP) students

No	Indicator	Pretest		Posttest		Effectiveness	
		Mean	%	Mean	%	Mean	%
A	Flexibility of Hand Movements						
1	The child is able to reach the sewing board using five fingers	2.25	56.25	3.58	89.58	3.83	95.75
2	The child is able to hold the sewing board using five fingers	2.25	56.25	3.25	81.25	3.50	87.50
	Average	2.25	56.25	3.42	85.42	3.67	91.63
B	Hand Eye Coordination						
3	Able to carry out sewing tasks in accordance with directions	2.50	62.50	3.50	87.50	3.88	96.88
4	Able to control hand movements while working on sewing tasks,	2.50	62.50	3.55	88.75	3.78	94.50
5	Able to concentrate while working on sewing tasks	2.75	68.75	3.63	90.75	3.50	87.50
	Average	2.58	64.58	3.56	89.00	3.72	92.96
C	Accuracy						
6	Able to insert the rope into the sewing board holes according to the directions	2.50	62.50	3.48	87.00	4.00	100.00
7	Be able to use thumb and index finger to pull the string out of the sewing board hole	2.75	68.75	3.55	88.75	4.00	100.00
8	Able to exert fingers to do sewing tasks until all holes on the sewing board are covered with string	3.00	75.00	3.50	87.50	3.80	95.00
9	Able to sew following the holes on the sewing board	2.00	50.00	3.40	85.00	3.25	81.25
	Average	2.56	64.06	3.48	87.06	3.76	94.06
D	Speed						
10	Be able to use hands to properly thread the string into the sewing board hole	2.50	62.50	3.48	87.00	3.83	95.75
11	Be able to use your hands to quickly pull out the string from the sewing board hole	2.25	56.25	3.55	88.75	4.00	100.00
12	Able to use hands to complete sewing tasks as directed	3.00	75.00	3.55	88.75	4.00	100.00
13	Able to show enthusiasm so that sewing tasks can be completed completely	3.00	75.00	3.63	90.75	4.00	100.00
14	Able to show the desire to change to a different picture pattern when it's finished	3.00	75.00	3.83	95.75	4.00	100.00
	Average	2.75	68.75	3.61	90.20	3.97	99.15
	Mean All	2.54		3.52		3.78	
	Score Percentage	63.41		87.92		94.45	

South Jakarta took place with very effective results. Related to the findings of previous research results, research on children with Cerebral Palsy (CP) to optimize movement using non-electronic media is still rarely done or is still difficult to find, especially in Indonesia, so the research that has been carried out includes using non-electronic media, namely in the form of sewing board media. In the field, the research has been applied based on the theory of child development so that adjustments have been made in the shape and size of the sewing board media used so that it is in accordance with the motor conditions of Cerebral Palsy (CP) students with various classifications of ability levels and those accompanied by other accompanying obstacles so that they can provide access. In addition, it is easy for Cerebral Palsy (CP) students to use the product so that the sewing board media that has been designed can be used to optimize the movement of Cerebral Palsy students.

5. Conclusion

After conducting research and development on the sewing board media, the following conclusions can be given, namely:

1. All subjects used were Cerebral Palsy (CP) SLB D YPAC students, South Jakarta. Due to the Covid-19 pandemic, which required no face-to-face activities in schools, thus limiting the sample to be targeted.
2. The advantages of this research are the sewing board media model used for Cerebral Palsy (CP) students at SLB D YPAC South Jakarta including the shape and size of the sewing board and the drawing model has been adjusted to the learning theme and changes according to the theme accompanied by a background with a choice of colors.
3. Sewing boards have provided benefits in training eye-hand coordination so that it is expected to optimize the fine motor skills of Cerebral Palsy (CP) students at SLB D YPAC, South Jakarta.
4. This research can still be developed again by using various innovations that can help Cerebral Palsy (CP) students, especially Cerebral Palsy (CP) students at SLB D YPAC, South Jakarta to optimize all their sensory abilities, especially fine motor skills.

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