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The Approach of Scientific Learning to the Outcomes of Sciences Learning to the First Class of Visual Impairment Students In SDLB-A YPAB Tegalsari Surabaya

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Abstract

The visual impairment had impact to academic ability of students with visual impairment. one of them to science, It caused the result of students learning less satisfied. To solve the problem required innovations in learning, one of them by applying the approach step of learning scientific to teaching-learning process. The purpose of this research was to know whether there or not influence of learning scientific approach toward learning result of science to the first class of students with visual impairment in SDLB-A YPAB Tegalsari Surabaya.

The method used in this research was quantitative and the type of research was sign test with "one group pre-test – post-test design". The data collection method used oral test and observation, the data analysis technique used statistic non parametric with willcoxon formula.

The research result indicated that the average value result of *pretest* was 30 and *post- test* was 83,33. The result of data analysis indicated Zh value (2,20) and Z table 5% (1,96) so the interpretation was Zh>Zt. So it could be concluded that Ho was accepted it meant that there was influence of learning scientific approach toward learning science result to the first class of students with visual impairment in SDLB-A YPAB Tegalsari Surabaya

Keywords: Learning scientific approach, student with visual impairment.

A. Introduction

The enviromental health is an important thing that need an attention. "The enviromental life is a space that occupied by all beings together with living things and unliving things" (Sriyanto, 2007: 107). The environment is the location for people to having activities with all the situation and condition,

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so the enviromental health need attention and should be tended, because the environment in direct altough indirect can influance the healthy of human life.

The destruction of environment will make the trouble which influence the human life and should confront by means of human, so they should offered the skill to cared for the environment in order to healthy continously and solve the environment problem (Sani, 2014:3). Certainly, the students with visual impairment will meet with the same problem, so that the students with visual impairment should obtain the skill to care for the environment, so they will healthy.

For students with visual impairment will realize the obstacle in obtain the information because they have condition of being limited in movement in an environment, so they will difficult in obtain the illustration about their sirrounding area, moreover with their mobility skill, the illustration about surrounding area still not complete, the disability also will influence in obtain the experience (Rahardja et al, 2010: 31). For chldrens with visual impairment, the concepts about an object become uncomplete, the uncomplete make the childrens do not have impression, perception, comprehension, memory, and appreciation in visually (Kosasai E., 2012: 182)

The students with visual impairment may not obtain the complete information, so theeir academic progress tending obstructed in compared with other children generally. The attempt in developing the academic skill of children with visual impairment in learning process need the colaboration between visual, hearing, tasting, groping, smelling to get identifiying,understanding, or meaning about the environment completely

The lesson about take care the environment in order to health constantly is discussed in sciences learning grade one of elementary school, whereas the children with visual impairment through difficulty in obtain the complete information and determine the concept, so they will trouble in construct the concepts, meanings, primarily in sciences learning about protecting environment.

In basically, Children with visual impairment need a education to developing all their potency optimally. The teacher should active and creativein developing the innovations in educate, especially for children with visual impairment, so they can develop their potency optimally and obtain the information and knowledge such as the other children generally. One of teh inovation in education is the approach of scientific learning. According to Daryanto (2014: 51), the learning with scientific approach is learning process that designed in order to make the student construst the concept actively, law, or a principle through observe, formulate the problem, formulate the hypotesis, collect data with some methodology, analysis data, conclution, and comunicate the innovation.

The approach of scientific learning reffered to give comprehensionto children in identifiying, understanding all kinds the matter used scientific approach (Daryanto, 2014: 51).

The achievment of erlier research, according to (Sintawati, 2014), the implementation of scientific approach discovery learning model in islamic religious education in Senior High School 1 Jetis Bantul obtain the information, the implementation of scientific approach with discovery learning model in islamic Religious education, able to make the students enthusiastic in learning, the curious of student

will develop, active, and centralize to the students and able to make the student ability develop in comunication.

According to the result of the observation by the researcher on 5th May 2014 – 6th June 2014 in SLB-A YPAB Tegalsari Surabaya, discovered that student with visual impairment in grade 1 have low sciences rate. It is increase with the low of student attention, and the limits of teacher.

So that, it need new inovation in order to make the sciences learning for student with visual impairment become more interesting, so that it can increase the student rate, especially in sciences learning. Students with visual impairment will be more creative, they will can make the concept of knowledge according to discovering by them self, because the approach of scientific learning is more priority in learning that make student become the center, it can make the student become active and more creative.

The approach of scientific learning wishes give support the students to be aware from all kinds of resource through observation, and not only notified by teacher. In implementation of learning process according to the scientific learnin need the teacher action, but when the student become mature or the grade is highter, the need of teacher is dicrease (Daryanti, 2014: 51). Student with visual impairment will know about the real event or real phenomenon, which can clarified by logic, not because of approximately, imagination, legend, or just fable.

So that, the researcher interest to arrange the research about The Approach of Scientific Learning Toward the Outcomes of Sciences Learning to The First Class of Visual Impairment Students In SDLB-A YPAB Tegalsari Surabaya.

B. Research Methodology

1. Research Design

This study use the pre-experiment design researh with one group pretest-posttest design. The analysis use the formula of Wilcoxon Match Pairs test.

2. Sample

The subject of this researh is 6 student with visual impairement, which 4 student with total blind and 2 student with low vision. The comprehension of all the student is insufficient in the concept of surrounding area environment. The subject of this reasearch is grade 1 elementary shool for student with visual impairment in Surabaya, Indonesia (SDLB-A YPAB Tegalsari Surabaya).

Table 3.1 Subject Research

NO	Subject	Birth	❑ Male/Female	❑ The level of visual impairment	
				Total Blind	❑ Low Vision
1.	NAM	10/04/2006	Female	√	
2.	KAJN	02/05/2007	Male	√	
3.	SAMAP	29/08/2006	Female		√
4.	RNF	10/11/2007	Male		√
5.	I	13/03/2004	Female	√	
6.	ADRH	02/06/2001	Male	√	

3. Variable

The dependent variable in this research is the study result in sciences learning. The independent variable is approach of scientific learning.

4. **Data Collecting Procedure**

a. Test

This research use verbal test that given to student with visual impairment.

b. Observation

The procedure of the observation in this researh is participant method, the interaction with subject is full during the aplication of approach scientific learning in science, and the subject matter is protect the environment.

5. Data Analysis Procedure

The procedure to analysis data use analysis nonparametric procedure, which use Wilcoxon Match Pairs Test formula. The formula is:

$$Z = \frac{T - \mu\tau}{\sigma\tau}$$

Pict. 3.2 Wilcoxon Match Pairs Test Formula (Sugiyono, 2013:136)

Z : The statistic precentage of Wilcoxon match pairs test result Nilai hasil pengujian statistik Wilcoxon match pairs test.

T : the quantity of rank/ the small rank Jumlah jenjang/rangking yang kecil

μ_T : Mean $\frac{n(n+1)}{4}$

σ_T : The Standard Deviation $=\sqrt{\frac{n(n+1)(2n+1)}{24}}$

n : The quantity of the sample

C. The Result of Study

1. Presentation Data

a. Result of Pretest Data

The results of a pre-test to determine learning outcomes IPA before being given treatment or treatment, tests used in pre-test is an oral test in which the teacher provides verbal questions and students answer questions verbally

Table 4.1 Data Pretest Result

❑ No	❑ Subject	❑ Score	❑ Final Score
1.	NAM	30	30
2.	KAJN	30	30
3.	SAMAP	20	20
4.	RNF	50	50
5.	I	20	20
6.	ADRH	30	30
The average number of values Pretest			30

b. Post-test Data Result

Data posttest results obtained from tests conducted after the students were given treatment.

Table 4.2 The Result Of Posttest

No.	Subject	The Correct Answer	Summary
1.	NAM	70	70
2.	KAJN	90	90
3.	SAMAP	80	80
4.	RNF	100	100
5.	I	70	70
6.	ADRH	90	90
The average number of Post test value			**83,33**

b. Calculation statistics using formulas *Wilcoxon Match Pairs Test*

So the value of Z count value is 2.20 (-) are not taken into account because of the absolute price . So that the calculation results of critical value for a = 5 % and 95 % level of truth (testing was conducted with two sides) , so that the value Ztabel = 1,96. So that from the analysis of the above data it can be seen that Ha received Zh > Zt.

2. Analysis Data

In this phase, researchers analyzed the collected data to answer the problem formulation and testing hypothesis which says " no effects of the application of scientific learning approach to science learning outcomes in children with visual impairment in SDLB class I - A YPAB Tegalsari Surabaya".

Pretest and posttest results data was then analyzed using non-parametric statistics using the formula match pairs Wilcoxon test

Here are the steps being taken in the analysis of the data

a. Creating a work table changes result of blind children learn science class I in SDLB - A YPAB Tegalsari Surabaya and determine.

No	X_{01}	X_{02}	The Change $X_{o2} - X_{o1}$	A sign level (T)		
				level	+	-
1.	30	70	+40	1,0	1,0	0,0
2.	30	90	+60	5,0	5,0	0,0
3.	20	80	+60	5,0	5,0	0,0
4.	50	100	+50	2,5	2,5	0,0
5.	20	70	+50	2,5	2,5	0,0
6.	30	90	+60	5,0	5,0	0,0
total =					**21**	**0,0**

T values (number of levels / ranks were small) .

Table 4.3 table of work for analysis data

b. Statistical Calculation Formulas Using Wilcoxon Match Pairs Test

The data in the form of research results and the value pretest posttest values that have been entered into the table above data analysis work is then analyzed using the Wilcoxon Match Pairs Test formula , with details as follow

Data processing with n = 6 and the standard error of 5% , those included in the formula Wilcoxon Match Pair Test.

$$Z = \frac{T - \mu\tau}{\sigma\tau}$$
$$= \frac{0-10,5}{4,77}$$
$$= -2,20$$

So the value of Z count value is 2.20 (-) are not taken into account because of the absolute price . So that the calculation results of critical value for **α** = 5 % and 95 % level of truth (testing was conducted with two sides) , so that the value Z table = 1.96. So from the above data analysis results can be known that Ha received Zh > Zt:

+2,20 > +1,96.

So we can conclude that Ha Ho accepted and rejected. If Ha accepted, meaning "there is the effect of applying a scientific approach to learning the learning outcomes of Natural Sciences in the first grade blind children in SDLB - A YPAB Tegalsari Surabaya".

2. Discussion

Based on the analysis of data, in pre-test showing the learning outcomes IPA blind children classes I still do not meet the minimum completeness criteria, this is caused by several factors, such as lack of direct experience in the learning process, learning media is less support for information concretely and learning process less enjoyable or less attract children to learn, so the concepts in understanding the subject matter of Natural Science is very limited and the lack of interactions of children with the teacher and the learning environment.

In applying the learning approach scientifically the learning outcomes of Natural Sciences (IPA), especially the material to maintain an environment in blind children are still in grade 1 primary school, it is not so simple, because in the process of teaching and learning approaches Scientific has a component of the learning process among observe, ask, try, reason and communicate.

In the process of observing, for visually impaired students, especially for blind children in total is not easy for them to do it, not like us normal people whose eyesight is still good, we know actually in the process of observing the sense of vision is very important here, does not mean that blind children cannot be observed on objects vicinity and the surrounding environment. For visually impaired students observe an object or the surrounding environment is certainly a way to use other senses are still functioning well, by optimizing the other senses as possible, such as observing an object to feel it, smell it, taste it and listen to it, hence the sense of touch, smell, taster, and the listeners of blind children are properly trained

To train the ability to observe objects and surrounding environment for visually impaired students need to be equipped beforehand mobility orientation ability of children. The ability of orientation, mobility is crucial taught to children since the early to train the child's independence, especially for children with visual impairment, due to the orientation mobility is a " process of using the

senses are functioning to determine one's position and its relationship with the surrounding environment" (Wahyuno, 1994: 10)

In addition to observing the stage, the stage of trying in the process of scientific learning approach also requires the ability orientation and mobility, particularly for blind children. In this study the subjects studied had seen different capabilities, there are children who are visually impaired in total and there are low vision. Of course, they also have ability to recognize objects, experiences, mobility and orientation ability are different, too. Kids with low vision because they still have some usable vision, of course, more or less had the experience, the ability of recognition on nearby objects, and the orientation of better mobility than children who experience total visual impairment

Every child has characteristics that are different, there are children who are active in following the teaching-learning process and there are passive, active child in following the teaching and learning process will certainly affect the learning outcomes of children, besides that for example in children, but overall showed an increase outcomes after implementation of scientific learning approach, especially on the subjects of Natural Sciences (IPA).

The initial stage of this study is to conduct a pretest that preliminary tests performed before the child is given treatment, in order to determine the ability of a child prior to the start of treatment or treatment given , the results of which will be used in analyzing the data with formulas Wilcoxon Match Pairs Test

Furthermore, students were given treatment or treatment as much as 6 meetings, each meeting time allocation of 2x30 minutes. The first meeting, Kids are invited to observe or observe classroom environment I, and the children asked about observations or observations that have been made and teachers provide feedback. According to Fuziah (2013) observation method is very beneficial for the fulfillment of the children curiosity, so that the learning process has a high significancee, with the observation method learners find the fact that there is a connection object that is analyzed by subject matter described by the teacher. So is the case with blind children, they observe about the surrounding environment with senses still function, namely the sense of touch, foretaste, smell, and hearing. In the process of this observation and approximately equal RNF children more active and aware of the object being observed compared to other children, is due to factors RNF and is approximately equal visually impaired low vision, while the other children to experience total visual impairment. However, at the stage of trying children who are visually impaired KAJN total, can perform well try this stage, because KAJN used to making sweeping activities, throwing trash in its place, and smoothing stuff around when at home. The next stage to reason and communicate, at this stage is basically the same as any other normal child, on stage and communicate the reasoning should be trained again, the previous should arouse the child's confidence so that children are able to communicate well in front of a larger audience.

The next stage is to carry out a test that is given posttest after being treated , posttest used to determine the ability of a child after being given treatment that is used as well as the comparison result of the value pretest . Posttest value is also used to analyze the data using formulas.

Based on the data presented in Table 4.1 to the value pretest and posttest Table 4.2 for value, the average value for prestest is 30 while the average value for the posttest was 83.33 . While based on the analysis of the data which has been described previously, the results Zh = 2.20 is greater than the value Zt crisis 5 % (for the two facets) = 1.96 (Zh > Zt) so that Ha Ho accepted and rejected . It can be concluded that there is the effect of applying a scientific approach to the learning outcomes of Natural Science (IPA) in children at SDLB Blind class I - A YPAB Tegalsari Surabaya.

The Effect of Scientific Research Learning Approach Toward Science Learning Outcomes in Children. The Blind Class I in SDLB-A YPAB Tegalsari Surabaya related to a previous study conducted by Marjan Johari (2014), entitled " Effect of Scientific Learning Approaches Toward Learning Outcomes Biology and Science Process Skills Students MA Mu'allimat NW Pancor Selong East Lombok Nusa Tenggara West". Research that has been done , we can conclude that the results of learning scientific approach is better than the learning models directly in improving learning outcomes biology and science process skills.

In the sense that has been mentioned by Frans in Wahyuno, E (2013 : 2) tunanera are people who experience irregularities or defects of the eye so the function of vision abnormalities, visual impairment can be classified, those who are totally blind and lack of view, include mild or severe . Kids cannot use vision senses like normal people in general, so they rely on other senses, such as the sense of hearing, touch, foretaste, and olfactory

As a result of the disruption of the sense of sight is the blind children have barriers in language, motor, social, and academic. In the academic field of blind children is difficult in the formation of concepts and understanding, so that each child receives knowledge tends to be abstract, so the impact on children's learning outcomes are unsatisfactory.

Based on OECD research results in the journal Marjan, Johari (2014), shows that Indonesia has science skills at rank 60 with a value of 383 (OECD, 2012) based on the results of the research indicate that education in Indonesia has decreased, especially in science learning . Whereas science education has a very important role in the increase the quality of human resources, so as to face the globalization in the field of science and technology.

To improve learning outcomes of blind children need approaches that can make a child understand and understand the concepts and understanding of learning materials mainly in natural sciences learning. The learning approach is a scientific approach to child -centered learning, experiential learning process as pursued by the child by means observe, ask, try, reason and communicate . Scientific learning approaches deemed appropriate to address the problems faced by children with visual impairment, especially in the academic field, especially in science subjects

D. Conclusion and Recommendations

1. Conclusions

No effect of applying a scientific approach to learning the learning outcomes of Natural Sciences (IPA) in the first grade blind children in SDLB - A YPAB Tegalsari Surabaya. This was evidenced by Zh (2.20) > Zt (1.96) at level 5% error.

2. Suggestions

Based on the research that has been carried out , it is known that scientific learning approach can improve learning outcomes in children with visual science first class in SDLB - A YPAB Tegalsari Surabaya, the researchers suggest :

1. Teacher

Preferably , in the process of learning to use the tangible medium, or concrete so that the child can immediately feel and put into practice what he learned, because of blind children will more easily understand the lesson when using media that is real, not just a theory that earned by children, for children with visual impairments itself difficult to abstract thinking. Teachers should use scientific learning approaches to improve learning outcomes of children.

2. Parents

Education will be achieved with the maximum if participation from teachers, parents and the community have a good cooperation, it is for the parents that consists of children with special needs, especially blind children, so do not feel embarrassed and assume the child is a burden or worry too much about these children, because they are just like any other normal child, want to be treated well and given a chance to work because his life every man has advantages and disadvantages. Besides the independence of the children also need to be trained and instilled to children as early as possible, so that if the child life in society, they have prepared for all possibilities.

3. Other Researchers

In this empirically, researchers have tried as much as possible, but if there is a shortage, then this is the limited ability of researchers. Therefore, if in the future no one has studied this issue , that would be carried out carefully to obtain better results and outstanding benefit education in the future. The results of this study can be used as a reference in related research.

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