

**The Effectiveness Of Mathematics Learning Outcomes Through Smart Pocket Card Media (Picture Card And Number Card) In The ABA 15 Kindergarten**

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Abstract

This study aims to streamline mathematics learning outcomes through smart pocket card (picture cards and number cards) so that group B students can students in identifying and exploring mathematical abilities with further drawings that can be arranged into more complex material operations.

This study uses a mix of methods with research and development methods (Research and Development) The product developed in this study is a model of early childhood mathematics learning through smart pocket card learning media (picture cards and number cards). As explained above, this research uses a mix methods approach with three main methods including descriptive, evaluative, and experimental methods. Descriptive method is used to collect data about the condition of products that have been compared for products to be developed, the condition of the users, students and teachers, as well as inhibiting and supporting factors for the creation of products to be created.

From the results of the effectiveness test at the three schools above it proves that the learning media of smart poeket cards (picture cards and number cards) developed by this researcher can significantly improve the learning outcomes of early childhood mathematics in kindergarten group B Aba 15 Teluk, therefore it can it was concluded that the process carried out in the development of the model as well as the results obtained from the application of the smart pocket card learning media (picture cards and number cards) met the criteria of a good learning media that had validity, was practical, and was effectively used as an alternative learning media for improve children's learning outcomes in mathematics.

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INTRODUCTION

Early childhood is a very appropriate time to be given education that can stimulate various developments. At this age a child has an extraordinary ability to receive new information that enters his brain. In neurology studies, it is stated that every child born with a complete brain organization that contains billions of brain neuron cells that are ready to be developed and actualized to reach the highest potential level is ready to process several trillion information in human life Directorate of madrasa education (2010). This study illustrates the enormous potential of a child who is ready to be stimulated to achieve optimal development. Therefore it is important if every child is given stimulation in an effort to develop the potential he has.

The method of playing picture cards can develop mathematical skills in children in group B Aisyiyah Kratonan 2014/2015 school year, the results of this study the method of playing picture cards can develop children's mathematical abilities. The application of the pictorial number card playing method can be maximized because it is supported by real media, so that children are interested and enthusiastic in participating in the learning conducted by researchers. (Eni Yuliana, 2016). Based on preliminary observations at Aba 15 Teluk Kindergarten, in this study the reality shows that learning at Aba 15 Teluk Kindergarten is often less attractive to children. There are several things that cause this, including the teacher's body language which is still stiff, the presentation is less attractive and the teaching aids are minimal, the teacher is not right to choose the teaching aids, the lack of media and learning resources, and the creativity of the teacher in creating teaching aids to support learning so in teaching and learning activities teachers and children are less so enthusiastic and tend to get bored with the tasks given and ultimately underestimate the lesson as a result the process of teaching and learning activities are hampered and less optimal. It is this way of learning that makes children feel

bored or bored so that their interest in arithmetic seems to decrease.

In an effort to create enjoyable learning, it is necessary to develop a learning media that can stimulate early childhood mathematics. The media developed are in the form of educational games that are able to develop early childhood mathematics.

Trying to create and develop an educational game tool to stimulate early childhood mathematics. The game to be developed is a smart pocket card game (picture cards and number cards). Through this smart pocket card game (picture cards and number cards) the researchers then designed and developed the game. To stimulate children's activities when playing early mathematics in early childhood, therefore this game is as detailed as possible to stimulate early childhood mathematical activities and for children to do so by understanding and understanding through smart pocket card educational toys (picture cards and number cards) . The impact of this smart pocket card learning media (picture cards and number cards) is that children learn early childhood mathematics to understand the concept of numbers. The difference from previous research is that this media is designed to stimulate early childhood mathematics so that children can understand the symbol of numbers.

Smart pocket card learning media (picture cards and number cards) inspired by game pockets can arouse children's motivation to learn something including learning mathematics. The advantages of smart pocket cards (picture cards and number cards) include, (1) creating a pleasant learning atmosphere, (2) the process of activities carried out by individuals and teachers, (3) introducing children to follow the rules in the game.

Based on the description above, the researcher considers an interesting learning media to improve mathematics learning outcomes very needs to be realized, because the learning media is adjusted to the stages of child development and uses the principle of learning

while playing or playing while learning, therefore researchers are interested in conducting research entitled "The effectiveness of learning outcomes in mathematics through the media of smart pocket cards (picture cards and number cards) in group B Aba 15 TK kindergarten."

RESEARCH METHOD

Research and development of smart pocket card media (picture cards and number cards) will be carried out in the 5-6 years age group at Aba 15 Teluk Kindergarten. Determination of the place of research is based on sampling with a random area sampling method, then the research sites are produced in East Jakarta Ikal Kindergarten, Pertiwi Karangsoka Kindergarten, and Aba 15 Teluk Kindergarten.

This study uses a mix of methods with research and development methods (Research and Development) The product developed in this study is a model of early childhood mathematics learning through smart pocket card learning media (picture cards and number cards). As explained above, this research uses a mix methods approach with three main methods including descriptive, evaluative, and experimental methods. Descriptive method is used to collect data about the condition of products that have been compared for products to be developed, the condition of the users, students and teachers, as well as inhibiting and supporting factors for the creation of products to be created.

Analysis of this data exists This trial aims 1) to find out whether the design of smart pocket card learning media models (picture cards and number cards) has been implemented properly and correctly by early childhood in improving early childhood mathematics learning outcomes, 2) how effective mathematics learning outcomes for young children through the learning media of smart pocket cards (picture cards and number cards). Thus the quantitative approach is used to find the effectiveness of the experimental research design

in the form of the one group pretest-posttest design.

Table.1 Design research in testing the effectiveness of media

Subject	PreTest	Treatment	PosTest
R	O ₁	P	O ₂

The steps taken in this trial include, 1) establishing a group of research subjects, 2) carrying out a pre-test (O1), 3) trying a model that has been developed, 4), carrying out a post-test, 5) looking for a pre-test average score and post test, 6) find the difference between the two averages through the statistical method (t test) to determine whether there is a significant influence of the use of formula models to process data as a whole as the test subjects using the SPSS program with the paired sample t test formula is a paired two-sample t test. While qualitative data is obtained based on non-numerical data which is a description of the results of the assessment of each aspect. The data is the result of an interview conducted by the avakuator team. In this case the statistical calculation used by using the paired t test formula or paired t test as follows:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2} - 2r \left(\frac{s_1}{\sqrt{n_1}}\right) \left(\frac{s_2}{\sqrt{n_2}}\right)}}$$

Information:

- t: value of t count
- x1: average value of the first group
- x2: the average value of the second group
- s1: first group variance
- s2: second group variance
- n1: many first group subjects
- n2: many second group subjects
- r: correlation between two samples

RESULTS AND DISCUSSION

Test the Effectiveness of Smart Pocket Card Learning Media (Picture Cards and Number Cards)

The effectiveness of the smart pocket card learning media (picture cards and number cards)

is done to see the extent to which the smart pocket card (gambar card and number card) media products that have been developed usually improve children's mathematics learning outcomes. The effectiveness of this media product can be seen from the results of the assessment that have been obtained from the pretest and posttest scores of children. As an assessment conducted at three different schools, the results of the effectiveness test are explained as follows:

Effectiveness Test in Small Group Trials at TK Ikal, East Jakarta

The first effectiveness test was conducted at the East Jakarta Ikal Kindergarten, while the number of children used as a small group test sample was 8 children. The details of the results of the pretest and posttest assessment of children in the small group test, can be seen in the table below:

Table 2. Values of Pretest and Posttest Learning Outcomes of Mathematics in Small Group Tests

Number	Child's Name	Pretest	Posttest
1.	AS	36	52
2.	FT	40	56
3.	SH	48	59
4.	DM	40	56
5.	RM	44	59
6.	SY	36	52
7.	TN	41	56
8.	SJ	41	57

After obtaining the results of the pretest and posttest mentioned above, then the calculation is performed to see the results of the initial assessment and the final assessment of children's mathematics learning outcomes. The calculation is done using SPSS with the formula paired sample t test which is a t test of two paired samples. From the paired test results in East Jakarta Ikal Kindergarten obtained t count 24.777 and t table 0.70639 so there is a significant difference or HO is rejected then H1 is accepted. So it can be concluded that there is a difference between children's mathematics learning outcomes before and after the smart pocket card learning media is given (picture cards and number cards). In other words the use

of smart pocket card learning media (picture cards and number cards) can influence in improving children's mathematics learning outcomes and make a positive contribution in learning at TK Ikal, East Jakarta.

Effectiveness Test in Large Group Trials at Pertiwi Karangsoka Kindergarten

Large group test at Pertiwi Karangsoka Kindergarten, as for the number of children used as a large group trial of 20 children. The results of the assessment on the effectiveness test of this large group are described as follows:

Table 3. Pretest and Posttest Value of Children Mathematics Learning Outcomes in Large Group Tests

Number	Child's Name	Pretest	Posttest
1.	SW	40	56
2.	GG	48	56
3.	WD	44	60
4.	GN	41	56
5.	FD	33	48
6.	SA	41	57
7.	WW	52	64
8.	JL	47	63
9.	TM	54	62
10.	MS	40	56
11.	BN	42	56
12.	FL	52	64
13.	HR	44	60
14.	YT	40	56
15.	DRI	40	56
16.	FGB	44	60
17.	CH	47	63
18.	IL	40	56
19.	MV	54	64
20.	SP	44	60

The results of the pretest and posttest on the effectiveness test at TK Pertiwi Karangsoka, above will then be calculated using SPSS with the paired t test formula which is a t test of two paired samples. From the t test results obtained t count 23.214 and t table 0.68695 or t count > t table then there is a significant difference or HO is rejected, because HO is rejected then H1 is accepted. So it can be concluded that there are differences between children's mathematics learning outcomes before and after being given the smart pocket card learning media (picture cards and number cards). In other words, the

use of smart pocket card learning media (picture cards and number cards) has an effect in improving children's mathematics learning outcomes and making a positive contribution to learning in Pertiwi Karangsoka Kindergarten.

35.	FA	33	60
36.	NUS	36	64
37.	CWL	36	60
38.	EDS	40	60
39.	CFD	30	64
40.	ARD	40	64

Effectiveness Test in Field Trials in Kindergarten Aba 15 Teluk

The last media effectiveness test was conducted at Aba 15 Teluk Kindergarten. In this effectiveness test the researcher used a sample of 40 kindergarten B children, while the results of the pretest and posttest can be seen in the table below:

Table 4. Pretest and Posttest Value of Children Mathematics Learning Outcomes in Field Group Tests

Number	Child's Name	Pretest	Posttest
1.	AW	44	64
2.	DD	40	56
3.	QD	44	60
4.	CS	48	64
5.	GB	44	56
6.	GHR	60	63
7.	YTR	44	60
8.	NB	40	64
9.	JK	40	60
10.	RD	40	64
11.	BK	40	56
12.	TTY	40	60
13.	AS	40	60
14.	DL	32	60
15.	CW	44	64
16.	KS	40	60
17.	AP	36	64
18.	NR	40	60
19.	SC	36	64
20.	NA	36	48
21.	DJ	32	56
22.	JS	36	64
23.	MZN	35	60
24.	ATL	40	60
25.	TP	40	64
26.	WD	36	60
27.	HOY	33	64
28.	AM	36	60
29.	DPM	40	64
30.	ALQ	40	60
31.	TR	48	64
32.	ADM	36	64
33.	ISN	40	60
34.	MWY	36	64

From the results of the t test using SPSS with the formula paired sample t test which is a t test of two paired samples obtained t count 24.137 and t table 0, 68067 or t arithmetic > from t table, so there is a significant difference or Ho is rejected. Because Ho is rejected and H1 is accepted, it can be concluded that there are differences between children's mathematics learning outcomes before and after being given a smart pocket card learning media (picture cards and number cards), in other words the use of this smart pocket card learning media can influence in improving learning outcomes children's mathematics and make a positive contribution in learning at Aba 15 Teluk Kindergarten.

From the results of the effectiveness test at the three schools above it proves that the learning media of smart poceket cards (picture cards and number cards) developed by this researcher can significantly improve the learning outcomes of early childhood mathematics in kindergarten group B Aba 15 Teluk, therefore it can it was concluded that the process carried out in the development of the model as well as the results obtained from the application of the smart pocket card learning media (picture cards and number cards) met the criteria of a good learning media that had validity, was practical, and was effectively used as an alternative learning media for improve children's learning outcomes in mathematics.

CONCLUSION

Based on the discussion and analysis of the data, the research and development of smart pocket card media (picture cards and number cards) at Aba 15 Teluk Kindergarten can be summarized as follows:

1. The problems seen from the preliminary study are that children are still not

- calculating smoothly, the media provided by the teacher is still limited and monotonous.
2. Analysis of needs shows that the above problems occur because of the lack of learning media to improve children's mathematics learning outcomes in Kindergarten Aba 15 Gulf. One way that is assumed by researchers to be able to improve children's mathematics learning outcomes in conveying ideas is the provision of attractive learning media to help smooth learning activities such learning media need to be designed according to the needs and development of children's mathematics and adapted to the context of the surrounding environment in this case requires the teacher's creativity and innovation in designing media that is interesting for children so that they can support the learning outcomes of children developing well.
 3. Smart pocket card media (picture cards and number cards) can be an alternative solution to the problem of learning media in schools which are still limited in number, lack of variety or monotone so that it is less attractive to children. Media smart pocket cards (picture cards and number cards) have a pocket board for picture cards and number cards. Smart pocket card media (picture cards and number cards) offers advantages. 1) the size of a smart pocket card (picture cards and number cards) can be a center for counting activities of 1-2 children, 2) using bright colors, 3) images that are liked by children.
 4. Based on the results of the feasibility trial on the use of media carried out at three East Jakarta Ikal kindergartens, Pertiwi Karangasoka kindergarten, and Aba 15 Teluk kindergarten get the results of the first effectiveness test in small group trials in East Jakarta Ikal kindergarten calculated by paired t test, t count is 24.733 and t table 0.70639 t count > t table so there is a significant difference or H₀ is rejected and H₁ is accepted. Furthermore, the results of the second effectiveness test in a large group trial at TK Pertiwi Karangasoka obtained the results of t count 23.214 and t table 0.68695 or t arithmetic > t table, so that there were significant differences or H₀ rejected and H₁ accepted. The results of the last effectiveness test in the field test conducted in Aba 15 Bay Kindergarten obtained the results of t 24.213 and the t table 0.68067 or t arithmetic > t table then there was a significant difference or the H₀ was rejected. From the results of the effectiveness test in the three Kindergartens B group, it can be concluded that there is a difference between mathematics learning outcomes before and after the learning media for smart pocket cards (picture cards and number cards) with the word use of learning media for smart pocket cards (picture cards and number cards) this can have an effect in improving children's mathematics learning outcomes and making a positive contribution to learning in group B in Aba 15 Teluk Kindergarten.
 5. Data retrieval in the feasibility test of the smart pocket card media (picture cards and number cards) is only done through assessments in the form of pretest and posttest, but supplemented with field notes and interviews with teachers. From the field notes found the following notes: 1) children are very enthusiastic and interested in using smart pocket card learning media (drawing cards and number cards), 2) children like the pictures on the drawing cards, 3) some children initially do not threaten counting but when there is learning media for smart pocket cards (picture cards and number cards) these children are interested in counting smoothly. Then based on interviews with the three schools' teachers each 3 teachers were interviewed, there were answers that on average said that they were very interested and liked the smart pocket card learning media (picture cards and number cards) according to them this

learning media had ideas that were creative and able to improve children's learning outcomes in mathematics. Besides learning media smart pocket cards (picture cards and numbers) are able to provide understanding and improve children's mathematics learning outcomes.

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