

DEVELOPMENT OF PANTUPOL GAME MEDIA TO IMPROVE YOUNG LEARNERS' COGNITIVE ABILITIES

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ABSTRAK

Konsentrasi memiliki peran penting dalam perkembangan kognitif anak. Sudah seharusnya hal ini menjadi perhatian pendidik dalam memahami pentingnya media pembelajaran sebagai sumber belajar anak. Media permainan pantupol merupakan media yang didesain untuk meningkatkan kemampuan kognitif anak. Tujuan penelitian ini yaitu (1) Untuk mendeskripsikan desain pengembangan pantupol sebagai media untuk meningkatkan kemampuan kognitif pada anak usia 5-6 tahun di TK Muslimat Al Fattah Sembungjambu. (2) Untuk mengetahui kelayakan pengembangan media pantupol untuk meningkatkan kemampuan kognitif pada anak usia 5-6 tahun di TK Muslimat Al Fattah Sembungjambu. Penelitian ini merupakan penelitian R&D dengan mengacu pada pendapat Borg & Gall. Dengan subjek penelitian anak kelompok B TK Muslimat Al Fattah Sembungjambu. Metode yang digunakan dalam pengumpulan data diantaranya: wawancara, observasi, dokumentasi, dan angket. Teknis analisis data berupa data proses pengembangan produk, dan analisis data produk yang dihasilkan. Hasil penelitian menunjukkan bahwa, setelah penggunaan media pantupol pada uji lapangan terbatas dengan subjek 7 anak mendapat presentase 80% dengan kategori 3 anak BSH dan 4 anak BSB. Pada uji lapangan secara luas dengan subjek 14 anak, mendapat presentase 83% dengan kategori 4 anak BSH, dan 10 anak BSB. Berdasarkan pemaparan dari hasil penelitian serta hasil analisis tersebut maka produk dapat dinyatakan layak digunakan untuk meningkatkan kemampuan kognitif anak.

Kata Kunci: Kognitif, Konsentrasi, Media Permainan Pantupol

ABSTRACT

Concentration has an important role in children's cognitive development. This should be a concern for educators in understanding the importance of learning media as a source of children's learning. The pantupol game media is a medium designed to improve children's cognitive abilities. The objectives of this research are (1) to describe the design for developing pantupol as a medium to improve cognitive abilities in aged children 5-6 years at Al Fattah Sembungjambu Muslimat Kindergarten, (2) to determine the feasibility of developing pantupol media to improve cognitive abilities in children aged 5-6 years at the Al Fattah Sembungjambu Muslimat Kindergarten. This research is an R&D research with reference to the opinion of Borg & Gall. With the research subjects being group B children at Al Fattah Sembungjambu Muslimat Kindergarten, the methods used in collecting data included interviews, observation, documentation, and

questionnaires. Technical data analysis in the form of product development process data and analysis of the resulting product data. The research results show that after using pantupol media in a limited field test with 7 children as subjects, it got a percentage of 80% with categories of 3 BSH children and 4 BSB children. In a wide field test with 14 children as subjects, it got a percentage of 83% with categories of 4 BSH children and 10 BSB children. Based on the presentation of the research results and the results of the analysis, the product can be declared suitable for use to improve the cognitive abilities.

Keywords: *Cognitive, Concentration, Pantupol Games Media*

INTRODUCTION

Early Childhood Education is an effort to educate children from birth to age six years through stimulation education to help children grow and develop both physically and spiritually so that they are ready to continue to the next level of education. The sequence of changes that form development is a harmonious unity influenced by physical and psychological aspects. During early childhood, when children are experiencing a process of rapid growth and development that can even be called a developmental leap, it is the right time to instill basic knowledge in them according to their developmental stages.

Children's cognitive development early childhood includes development general knowledge, development shape, color, size and pattern, development of the concept of number, development of number symbols and letter. The child's ability to interact with numbers, think logical and scientific, and think logically consistency is an indicator numerical intelligence. Number, calculate, find relationships causation, and classification are all aspects of development math logic. Not only related to counting, but also other math skills such as thinking skills, and match, group, arrange, count, separate, measure, and compare. Develop the concept of addition and subtraction by counting real objects, connecting quantities with symbols.

Cognitive development needed to support other developments, such as language and intelligence development other. Sociocultural perspective Vygotsky argued that language and social interaction is necessary for cognitive development. Main means a child to express his wants and needs are through language. Child with the ability to express thoughts and feelings and interacting with the environment. Because playing is the main component in develop programs

learning for early childhood, then communication between educators or people parents with children becomes very important to support its development. One way is to guide children in complete developmental tasks in early childhood through play. It is believed that the education of children aged early childhood plays a very important role important in growth and development of science furthermore.

Playing has an effect positive for children, as evidenced by their early roles as characters in the game. Basically a child learn through play. so that the play activity makes meaningful learning. Availability game tools as media supporting the implementation of learning children effectively and pleasantly so that children can develop various potentials optimally cannot be separated from the use of assistive devices display as support. Activity playing cannot be separated from use educational teaching aids media, by hence it is important for educators contributed to creating APE as a learning medium.

Research conducted by Anisah Mursida in 2020 with the title “Media Development Learning Made from Bottle Caps Used In Improving Numeracy Ability of Children Aged 5-6 Year at RA Al-Hafizh H. Ali Tanjung Morawa T.A 2019/2020”. With result use of learning media with a bottle cap develop cognitive abilities for children aged 5-6 year (Mursida, 2020).

Research conducted by Sri Rahayu Saputri in 2021, with the title "The Influence of Media Box Bottle Cap (Bottle Cap Magic Box) On the Ability to Recognize Letters Alphabets for Children Aged 5-6 Years”. Results research by providing media on language learning can influential in improving language abilities of children aged 5-6 year (Saputri, 2021).

Research journal performed by Muthmainnah Nurma in 2019, with the title “Improved Cognitive Abilities Children Through the Media of Bottle Caps in Kindergarten Meulati Mon Pasong West Aceh”. With the media results you can get a bottle cap improve cognitive abilities child (Nurma, 2019). Games are something can be played, both in the form of goods or others. Play share early childhood is learning. With so playing is not in vain, because by actually playing, children too carry out learning. So we must understand that the child's world is the world of games and children develop through play. That why we can't take it their

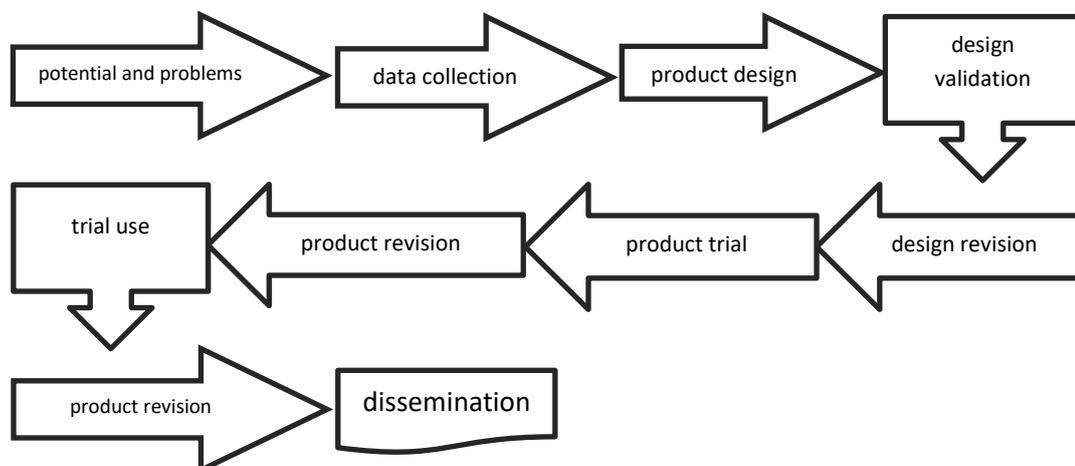
play time. In line great, the game has urgency which are cognitive, social, and emotional. For cognitive urgency, here the game can help children's cognitive abilities, through children's games can explore the environment, study the objects that exist in surroundings, and learn to solve the problem he faced.

Ministry of Education National defines cognitive development as manifestation of primary abilities such as language skills, memory, reasoning or logical thinking, insight spatial, number skills, ability to use words, and the ability to observe with fast and careful. The name *Pantupol* has stands for Bottle Cap Board. Media pantupol game is a tool educational games to help and make things easier for children develop cognitive. Pantupol designed in such a way to stimulate children in learning counting, classifying colors, recognize shapes. This research aims to describe the design development of pantupol as a media to improve abilities cognitive abilities in children aged 5-6 years in kindergarten Muslimat Al Fattah Sembungjambu and test its feasibility.

METHOD

The method used in this research is a research method Research and Development. According to Gay, research development is an inner effort make a capable product not for school use testing theories (Putra, 2013). Borg and Gall defines research development is a process develop and test products education. This research is guided by on research procedures development according to Borg & Gall. There are ten development procedures as follows:

Figure 1. Borg & Gall Research Process Development Research Procedure Chart



However, due to limited time and funding in research this development researchers took seven procedures from Borg & Gall's theory that researchers use in studies this development. As for seven product development process steps as follows:

1. Preliminary Studies and Collection of Initial Research Data

The first step to take namely generating ideas with read references from journals research and books. Then, researchers conduct initial research or field survey by coming visited Muslimat Al Kindergarten Fattah Sembungjambu. Visit done to obtain initial data and measure children's cognitive development through observation. After getting the data is then used as related research material with that problem found.

2. Product Planning

Once a problem is discovered, the next step is the researcher develop a product manufacturing plan pantupol by looking for material in books, journals and other reference sources. After finished product, researchers conduct tests validation carried out by experts material and media experts, PAUD experts for product suitability testing.

3. Initial Product Development

Once the product has been revised and has been validated by media experts, material experts as well as PAUD experts, researchers prepare a learning plan to carry out limited trials.

4. Limited Field Test

At this limited trial stage the researcher took 7 children as subjects class B Muslimat Al Fattah Kindergarten Sembungjambu. In this trial researchers make observations in the process of improving the product.

5. Product Improvement Test Results Limited Field

Based on the results of the trial limited, researchers found a response the positive side of media users, in the use of media when tested try it feels good so can be continued at the trial stage extensively.

6. Wide Field Test

At this stage, researchers conduct extensive field tests by testing it on 14 Class B students at Muslimat Al Fattah Kindergarten Sembungjambu. Researchers do final observations as a conclusion from the Pantupol product trial.

7. Final Product Revision

After getting the results and obtain data from carry out extensive field tests, the next step is product improvements. Then researchers draw conclusions from data found for testing Pantupol products. Data collection technique carried out by interview, observation, questionnaires and documentation. After all the data is collected the next step is analysis data. Data analysis techniques used in this research are qualitative model analysis and analysis quantitative descriptive. Analysis quantitative descriptive is used for calculation of product validation questionnaires and child assessment. Qualitative analysis used to describe results from observations, interviews and documentation carried out for determine the suitability of the product which was developed.

Calculation of product feasibility and the results of the child's assessment using the following formula:

$$\text{Percentage: } \frac{\text{total score obtained}}{\text{number of ideal scores (criterion)}} \times 100\%$$

After getting the percentage score then look at the eligibility table products and their assessment as following:

Table 1. Product Eligibility

Percentage	Level Of Validity
80 < skor ≤ 100	Very Worthy/BSB
60 < skor ≤ 79	Worthy/BSH
20 < skor ≤ 59	Unworthy/MB
skor < 20	Very Unworthy/BB

RESULTS AND DISCUSSION

Media product development the Pantupol game begins with product design. In game media Pantupol has several games contained in the media for stimulate cognitive development children aged 5-6 years, including ie classifying colors, mathematics simple, rope maze, sort of smallest to largest or vice versa, and create color patterns. Product design pantupol game media as following:

Figure 2. Front Side of the Game



Figure 3. Back Side Game



On the front side and behind the pantupol game stimulate cognitive development children with games contained therein include namely as follows:

1. Classify colors and sizes (in this game children can know the color and size as well classify them, in a way install the bottle cap accordingly the color of the seal on the neck bottles attached to the board).

2. Simple and familiar mathematics geometry (in this game children can recognize numbers with symbols for numbers, as well as addition, and geometric shapes. Child throws the dice then hook the rubber on the bottle cap there are a number of dice obtained, here the child will find geometric shapes from rubber to which he relates. Next is the child look for the number symbol written on the bottle cap correctly, children are given two chances throwing the dice where from the throwing is the child count the number of throws first and second dice in a manner count the bottle caps you have the child gives a rubber mark beforehand).
3. Rope maze (children are trained to solve it problems with focusing and concentration in the maze game rope according to the instruction card road).
4. Sort (differentiate “most/ter” and “bigger”, “more small” by sorting them from largest to smallest or vice versa use a bottle cap).
5. Create color patterns (on this game means children arrange colors from the range of colors available on the bottle cap with a colored pattern on the game board).

Product manufacturing process requires some materials and tool including sized boards 29x40 cm, bottle cap, cardboard, colored paper, and tools such as glue gun, scissors, stationery, crayons, which is used to make and designing pantupol games. Products that have been produced then a validation process is carried out carried out by material experts and media experts and PAUD experts. On the validation process was obtained there are 10 material expert validation results indicator with a total score of 37, and an average score of 3.7 with a number of percentages 92.5% so it can be categorized "very good". From the results of the validation aspect it can be concluded that the product can be declared fit for use. In the material expert validation assessment get input. As for input that is by replacing variations in color of bottle caps dominate with that color never existed before, as well as books instructions that are not yet detailed and activities are adjusted to indicators cognitive development to be more details and activities are tailored to suit cognitive development.

Table 2. Before And After Revision

Before	After
 <p>The image shows a red board with a 5x5 grid of colored buttons. The buttons are arranged in a pattern: Row 1: Yellow, Orange, Blue, Red, Green; Row 2: Yellow, Orange, Blue, Red, Green; Row 3: Yellow, Orange, Blue, Red, Green; Row 4: Yellow, Orange, Blue, Red, Green; Row 5: Yellow, Orange, Blue, Red, Green. At the bottom of the board, there is a blue strip with a math equation: $2 + 3 = 5$. The equation is written in white, with the numbers 2, 3, and 5 represented by small blue circles. The text "Pan Cup 01" is written in green at the top of the board.</p>	 <p>The image shows a red board with a 5x5 grid of colored buttons. The buttons are arranged in a pattern: Row 1: Yellow, Orange, Red, Green, Purple; Row 2: Yellow, Orange, Red, Green, Purple; Row 3: Yellow, Orange, Red, Green, Purple; Row 4: Yellow, Orange, Red, Green, Purple; Row 5: Yellow, Orange, Red, Green, Purple. At the bottom of the board, there is a blue strip with a math equation: $2 + 3 = 5$. The equation is written in white, with the numbers 2, 3, and 5 represented by small blue circles. The text "Pan Cup 01" is written in green at the top of the board.</p>

Further validation is carried out by media experts. Validation by experts media there are 10 indicators with the total score was 39, and the average score was 3.9 with a percentage of 97.5% so it can be categorized as "Very Good". From the results of the validation aspect it can be concluded that the product can be declared eligible for used. On expert validation assessment the media gets input. As for The input is color bottle cap that originally said colorful numbers for uniformed in the same color. As well as on the initial clue card has not been designed in such a way for added name writing design game.

Table 3. Before And After Revision

Before	After
	
	

The next validation was carried out by PAUD expert. Validation by PAUD experts there are 20 indicators in total score 78, and an average score of 3.9 with the percentage is 97.5% so can be categorized as "Very Good". From the results of this validation aspect, it can be obtained concluded that the product can declared fit for use. In the PAUD expert validation assessment get input. As for input this is a design addition on the bottle cap container with add ornaments in the form of pictures introduction to geometric shapes.

Table 4. Before And After Revision



After passing the validation test by material experts, media experts, and experts PAUD products are entering the trial phase field consisting of trials limited field and field trials wide. However, before carrying out the test limited field first pre-test is carried out before using educational game tools pantupol to find out child's cognitive development so far where. Following are the results of pre-testing before using game media pantupol:

Table 5. Results Of Previous Trials Use Of Pantupol Media

No.	Child's Name	Indicators For Assessing Cognitive Achievement			Total Score	Percentage	Criteria
		Learning And Problem Solving	Think Logically	Symbolic Thinking			
1.	AKN	2	3	2	7	58,33%	MB
2.	ALQ	2	2	3	7	58,33%	MB
3.	AS	3	2	3	8	66,66%	BSH
4.	CA	2	3	2	7	58,33%	MB
5.	FAD	3	3	3	9	75%	BSH
6.	FKH	2	3	2	7	58,33%	MB
7.	MAW	2	3	2	7	58,33%	MB
8.	MZA	3	3	2	8	66,66%	BSH
9.	MZF	2	3	3	8	66,66%	BSH
10.	NF	2	3	3	8	66,66%	BSH
11.	NT	2	2	3	7	58,33%	MB
12.	RAA	2	3	3	8	66,66%	BSH
13.	SA	2	3	2	7	58,33%	MB
14.	ZM	2	3	2	7	58,33%	MB
The Average Assessment Percentage is 62,5%							

Based on the assessment table above, before media use pantupol obtained an average percentage of 62.3% in the 8 child category beginning to develop (MB) and 6 children developing according to expectations (BSH). Next on limited trials involving 7 class B children from Muslimat Kindergarten Al Fattah Sembungjambu. Test results limited field trial of the product pantupol in the following table.

Table 6. Results of Limited Trials

No.	Child's Name	Total Score	Percentage	Criteria
1.	AKN	30	75%	BSH
2.	AS	34	85%	BSB
3.	CA	31	77%	BSH
4.	FAD	32	80%	BSB
5.	MAW	30	75%	BSH
6.	RAA	35	87%	BSB
7.	ZM	33	82%	BSB
The Average Assessment Percentage is 80%				

Based on the table above there is an increase in percentage children's cognitive development, where before using pantupol media obtained an average percentage of 62.5% after using pantupol media in limited trials increased to 80%. The next stage is testing the field broadly, namely involving 14 students in class B of Muslimat Al Kindergarten Fattah Sembungjambu. Can be seen in the table below:

Table 7. Wide Field Test Results

No.	Child's Name	Total Score	Percentage	Criteria
1.	AKN	31	77%	BSH
2.	ALQ	31	77%	BSH
3.	AS	33	85%	BSB
4.	CA	33	82%	BSB
5.	FAD	39	97%	BSB
6.	FKH	32	80%	BSB
7.	MAW	30	75%	BSH

8.	MZA	36	90%	BSB
9.	MZF	35	87%	BSB
10.	NF	33	82%	BSB
11.	NT	30	75%	BSH
12.	RAA	36	90%	BSB
13.	SA	34	85%	BSB
14.	ZM	34	85%	BSB
The Average Assessment Percentage is 83%				

From the results of extensive field tests there was an increase in the test percentage limited field that previously had been what is done is to obtain an average percentage of 80%, then on test the field at large has increased 3% with an average percentage of a number 83%. It can be concluded that the child is improving cognitive development, from before use of pantupol game media percentage of cognitive development, namely 62.5% and after using pantupol game with average limited field trial percentage 80%, in extensive field trials 83%. Based on the presentation of the results research and the results of the analysis then the product can be declared feasible used to improve cognitive abilities of children aged 5-6 years.

CONCLUSION

In media development pantupol game goes through a process product development planning done by conducting research first, then do it product development and validation to material experts, media experts, and PAUD experts conduct field tests limited, product revision, extensive field testing, and product results. Development this pantupol game uses used goods in the form of bottle caps and other materials such as sizing boards 29x40 cm, cardboard and paper colored.

From the products produced obtain a material expert presentation amounting to 92.5% with the category "very good" so it is suitable for use, then by media experts with obtained a percentage of 97.5% with category "very good" so it deserves it for use, and PAUD experts obtained a percentage of 97.5% with category "very good" so it deserves it to use. From the test results limited field

and extensive trials get category percentage results “very decent” with average percentage in field trials limited to 80% and in field trials broadly 83%. Based on data it can be concluded that the media pantupol game can be stated worth using to upgrade cognitive abilities of children aged 5-6 years.

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