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Understanding the Concept of Heavy and Light Through Weighing Activities for Children Aged 5-6 Years

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Abstrak

Penelitian ini yang didasarkan oleh pemahaman anak tentang konsep berat dan ringan belum optimal, terlihat dari jumlah anak 14 orang 5 anak dapat mengurutkan dengan benar, 9 anak lainnya belum mampu mengurutkan dengan benar di RA Hasanuddin Pontianak yang sudah mengenalkan konsep berat dan ringan. Tujuan dari penelitian ini untuk mengetahui adakah pemahaman konsep berat dan ringan melalui kegiatan penimbangan pada anak usia 5-6 tahun di RA Hasanuddin Pontianak Tenggara. Penelitian ini menggunakan pendekatan kuantitatif dengan metode eksperimen. Teknik pengumpulan data yaitu observasi, dokumentasi. Sampel pada penelitian ini adalah anak Kelompok B yang berjumlah 14 orang anak. Pengujian paired sampel t test pada aspek-aspek yang dinilai anak antara pre-test dan pos-test yakni dengan taraf signifikansi alfa sebesar 5% didapatkan nilai t hitung sebesar -11.678 dengan nilai significance 0,01 yang kurang dari alfa sebesar 0,05 maka keputusan yang dapat diambil adalah tolak Ho dan terima Ha, artinya terdapat pengaruh pemahaman konsep berat dan ringan setelah penerapan kegiatan penimbangan pada anak usia 5-6 tahun.

***Kata kunci**: Anak Usia 5-6 Tahun; Konsep Berat dan Ringan; Penimbangan*

Abstract

This research is that children's understanding of the concept of heavy and light is not optimal, it can be seen from the number of children 14 people 5 children can sort correctly, 9 other children have not been able to sort correctly at RA Hasanuddin Pontianak who has introduced the concept of heavy and light. The purpose of this study was to find out whether there is an understanding of the concept of heavy and light through weighing activities in

children aged 5-6 years at RA Hasanuddin Pontianak Tenggara. This study uses a quantitative approach to the experimental method. Data collection techniques namely observation, documentation. The sample in this study was group B children, which consisted of 14 children. Testing the paired sample t test on the aspects assessed by the child between the pre-test and post-test, namely with an alpha significance level of 5% obtained a t-count value of -11,678 with a significance value of 0.01 which is less than an alpha of 0.05, so The decisions that can be made are rejecting Ho and accepting Ha, meaning that there is an influence on understanding the concept of heavy and light after the implementation of weighing activities in children aged 5-6 years.

Keywords: Children Aged 5-6 Years; The Concept of Heavy and Light; Weighing

Introduction

Education has a very important role in supporting life because basically humans in carrying out their lives cannot be separated from the implementation and study of education according to the conditions and social situations that exist in society. According to Mumtazinur (2019), education in Indonesia studies three groups of knowledge, namely natural science, social science and humanities. Cultural education is education that develops cultural values and character in each student to develop themselves as individuals, members of society and citizens. Talking about cultural education, Indonesia itself is an archipelagic country that is rich in customs and culture. One of Indonesia's cultural heritage is batik (Wulandari, 2022).

Education about batik culture needs to be given from an early age because it is a strong foundation for children to know various cultures, especially batik, with their love for taking advantage of children's golden years when they are in the process of rapid growth and development (Sujiono, 2013). In relation to the importance of cultural education given from an early age, early childhood education has a very determining role. Currently, PAUD learning recorded in Minister of Education and Technology Decree 56/M/2022 concerning Curriculum Guidelines for Learning Recovery emphasizes strengthening the Pancasila student profile, namely using an independent curriculum. It is hoped that the existence of the Pancasila student profile project with one of its themes, namely the theme I Love Indonesia, can introduce children to Indonesian culture, one of which is batik culture. In this

theme, children are asked to learn about culture and get to know regional characteristics about Indonesia so that they understand their identity as Indonesian children who have a variety of cultures and distinctive characters and are proud to be Indonesian children. However, in the implementation of the Project for Strengthening the Pancasila Student Profile (P5), the theme I Love Indonesia with The topic of introducing batik culture to children turned out to be an obstacle faced, namely the limited media used in implementing P5 in introducing batik culture to children.

Based on interviews conducted on Saturday, January 7 2023 with group B teacher, namely Mrs. Umi at Yannas Bangkalan Kindergarten, the results showed that Yannas Bangkalan Kindergarten is one of the driving schools in Bangkalan and has used an independent curriculum. In implementing the project to convey the profile of Pancasila students (P5) at the Yannas Bangkalan Kindergarten, obstacles were found at the implementation stage of the P5 theme I Love Indonesia, the initial batik sub-theme, namely the lack of media that could attract children's attention in getting to know batik, because the basic introduction to batik was only done with lecture or storytelling method. Mrs. Ummi stated that to introduce batik to children, you could take the children to a batik gallery/batik making place. However, due to several considerations, it is not possible to bring children to the batik gallery. Mrs. Ummi also stated that learning in Group B had never used application-based media as a fun learning medium for children. From the results of the interview above, it can be concluded that the implementation of the independent curriculum in the introduction of batik culture in the implementation of the Project for Strengthening the Profile of Pancasila Students (P5) with the theme I Love Indonesia is still not optimal. One of the inhibiting factors is the limited media as a learning resource used to introduce batik culture to children. So we need a media that can support the implementation of P5 in the learning process about batik for children.

In the learning process, media plays a role in bridging the process of conveying and sending messages and information. Arsyad (2014) states that learning media is anything that is used to convey information t Early childhood is children aged 0-6 years. Law No. 20 of 2003 concerning the National Education System CHAPTER I, Article 1 point 14 states that early childhood education is a coaching effort aimed at children from birth to 6 years of age which is carried out through providing educational stimulation to help their growth and development. physical and spiritual development so that children are ready to enter further

education. (Permendikbud) No. 137 of 2014 concerning child development achievement standards (STTPA), there are 6 aspects of development that must be optimized in early childhood. Cognition is one of the many aspects that influences the thinking process of every human being. Piaget stated that cognitive development is the result of children's efforts to understand and act in their world (Talango, 2020). Understanding in Bloom's taxonomy in the cognitive domain is concerned with the essence of something, namely a form of understanding or comprehension that causes a person to know what is being communicated, and can use the material or idea that is being communicated without having to connect it with other material (Gunawan & Palupi, 2012) . A deep understanding of the situation or problem is an important first step in the weighing process.

Weighing is the activity of using scales or balances to identify cause and effect. Balance sheets are very good for training children to connect cause and effect because the results will be visible directly (Faisol, 2021). If the load on one arm of the scale is increased, the load will decrease. The use of weighing media (artificial and real) to develop cognitive abilities, especially in material for developing the ability to recognize weight measurements in group B children, can run effectively and efficiently (Hamid, 2013).

The results of observations on January 10 2023 at RA Hasanuddin, a group of children aged 5-6 years in class B1 with a total of 14 students at Raudhatul Athfal (RA) Hasanuddin, had already introduced the concept of light weight using media in the form of LKA (Children's Worksheet) but the results are not optimal. Activities in LKA, sort pictures of objects based on lightest, medium and heaviest sizes. Observations showed that 5 children could sort them correctly, 9 other children were not able to sort them correctly. This indicates that there are variations in understanding and mastery of the concepts of heavy and light between these children. Even though some of them can do the sorting correctly, there are still a large number of children who have not achieved an adequate understanding of this concept.

This research is based on previous research, including, (Surjanilim et al., 2021) "Increasing the Ability to Differentiate the Concepts of Heavy and Light Using Wooden Scales"; (Syafdaningsih et al., 2023) "Development of Scales Media Material for Measurement Concepts in Early Childhood"; and (Sa'ida et al., 2017) "Problem based learning as an effort to introduce the concept of measurement in early childhood." The novelty of this research lies in the research methodology. This research applies experimental methods or provides solution treatments.

Based on the background above, the aim of this research is to provide a solution regarding the gap in problems at RA Hasanudin through weighing activities so that children can understand the concept of heavy and light through their own experience. So the Null Hypothesis (Ho): "There is no influence on understanding the concepts of heavy and light after implementing weighing activities on children aged 5-6 years. Alternative Hypothesis (Ha): "There is an influence on understanding the concepts of heavy and light after implementing weighing activities on children aged 5 -6 years.

Method

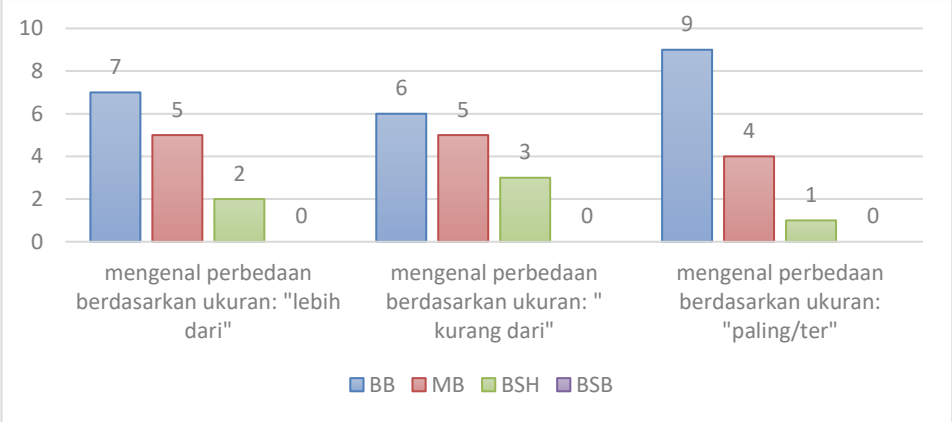
This study uses a quantitative approach. A quantitative approach is a method that is scientific and objective, and this research uses data in the form of numbers and uses statistical analysis to test a hypothesis (Arifin, 2020). This research method uses an experimental method using Pre-Experimental Designs. This research uses the One Group pretest-posttest form. The One Group pretest-posttest to get more accurate treatment results by comparing before being given treatment and after being given treatment (Nuryanti, 2019).

Results and Discussion

Understanding the Concept of Weight and Heating in Children Aged 5-6 Years at RA Hasanuddin Southeast Pontianak Before Going Through Weighing Activities. Before implementing treatment through weighing activities to understand the concept of weight and light in children, the researcher made observations first before entering the stage of providing treatment. Researchers conducted a pre-test on Monday 29 May 2023 in group B aged 5-6 years with a total of 14 children. The results of the assessment of the understanding of the concept of light and heavy before the weighing activity was carried out in group B showed that the understanding of the concept of heavy and light was not optimal, as seen from the results of the children's worksheets (LKA) given by the teacher, with the standard level of achievement of children's development within the scope of cognitive development in the 137 year old Education and Culture Ministerial Regulation. 2014 age range 5-6 years. The indicators used are: Recognizing differences based on size: "more than"; Recognize differences based on size: "less than; Recognize the differences based on size: most/ter.

In Indicator 1, children recognize differences based on size: "more than" there are 7 children who get the score Not Developing (BB), there are 5 children who get the value Starting to Develop (MB), there are 2 children who get the score Developing According to

Expectations (BSH) and there are no children received a Very Good Developing (BSB) grade. Indicator 2 children recognize differences based on size: "less than" there are 6 children who got the score not yet developed (BB), there are 5 children who got the score Starting to Develop (MB), there are 3 children who got the score developing as expected (BSH) and no children got the very well developed value (BSB). Indicator 3 children recognize differences based on size: most/most, there are 9 children who got the score not yet developed (BB), there are 4 children who got the score starting to develop (MB), there is 1 child who got the score developing as expected (BSH), and there are no children which received a Very Good Developing (BSB) score.



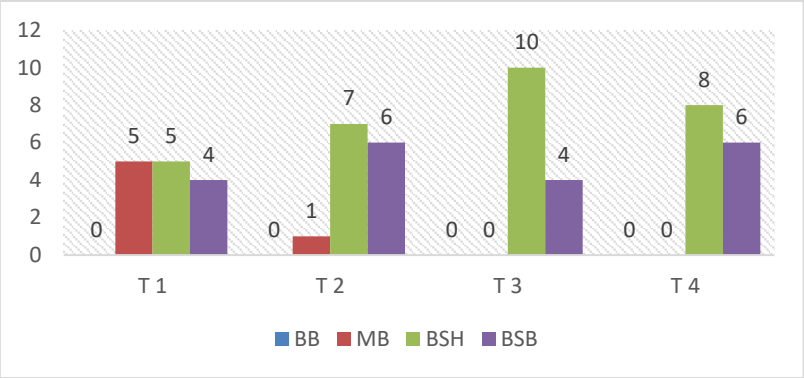
Picture 1. Grafik *Pre-test*

Understanding the Concept of Heavy and Light in Children Aged 5-6 Years at RA Hasanuddin Southeast Pontianak After Going Through Weighing Activities. After getting a score for understanding the concept of heavy and light before going through the weighing activity, treatment is given through the weighing activity. The treatment activities are as follows:

Graph of understanding the concept of heavy and light through weighing activities (treatment 1-4). The following graph corresponds to the indicators that have been carried out according to the treatment.

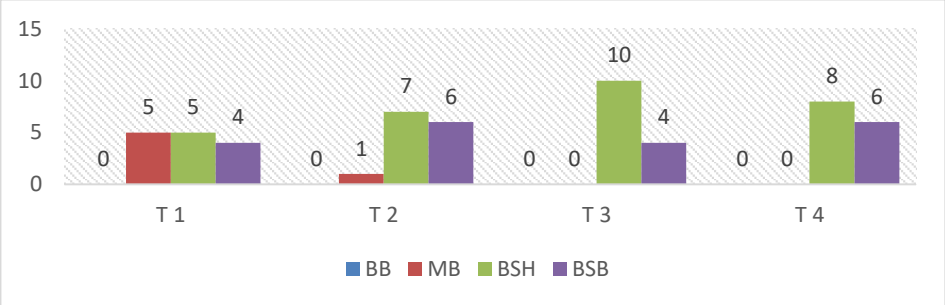
1) Children can recognize differences based on size: "more than"
2) Children can recognize differences based on size: "less than"
3) Children can recognize differences based on size: "most/ter"

Indicator 1: children are able to recognize differences based on size: "more than"



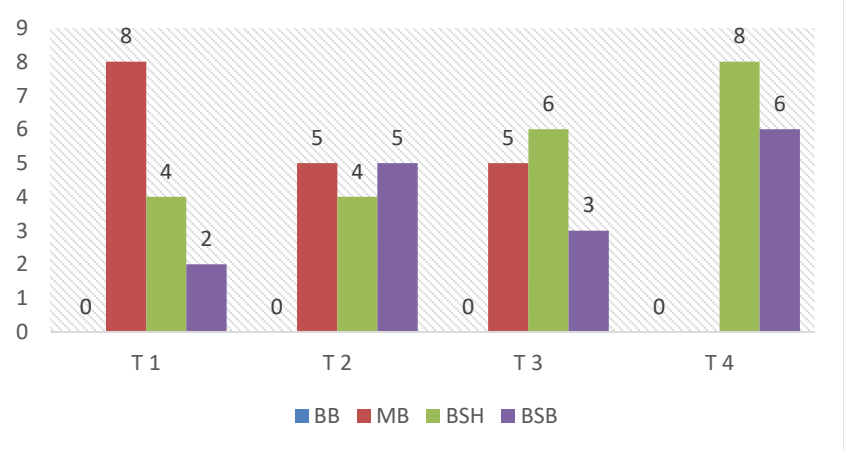
Picture 2.
Chart Recognizing Differences Based on Size: "More Than"

Indicator 2: children are able to recognize differences based on size: "less than"



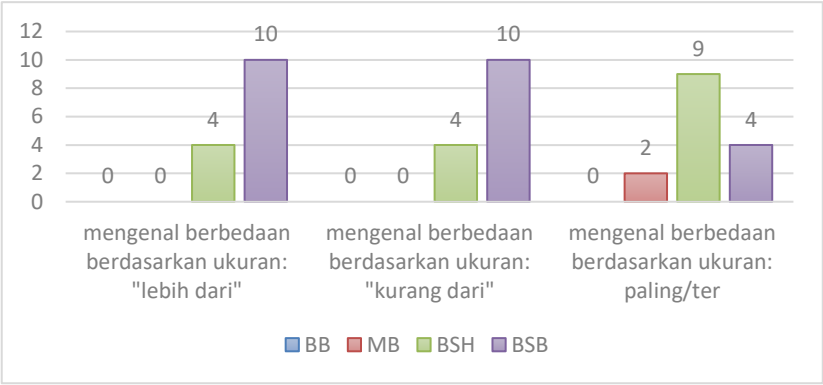
Picture 3
Chart Recognizing Differences Based on Size: "Less Than"

Indicator 3: children are able to recognize differences based on size: "most/ter"



Picture 4
Graphic Identifying Differences Based on Size: "Most/Most"

After treatment, through weighing activities to understand the concept of heavy and light in children, a post-test is needed. Post-test is the final stage, post-test is carried out to determine success after treatment. The treatment was given four times, with three activities, the first activity was weighing using manipulative scales, the second activity was weighing using digital scales and the third activity was sorting from heaviest to lightest.



Picture 5
Graphic *Post-test*

The pre-test results are to determine the child's initial abilities and the post-test aims to determine the results of the influence and treatment after going through the weighing activity. The results of the pre-test and post-test analysis obtained using SPSS are as follows:

1. *Normality Test*

	Kolmogoro Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre Test	.185	14	.200*	.912	14	.166
Post Test	.224	14	.054	.880	14	.058

Table 1 Uji Normalitas

2. *Paired samples statistics*

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre Test	4.86	14	1.351	.361
	Post Test	10.43	14	1.089	.291

Table 2. Paired samples statistics

3. *Paired Samples Tes*

					95% Confidence Internal of the Difience				Signifcance	
		Mean	Std.Deviation	Std. Error Mean	Lower	Upper	t	df	One-Sided p	Two Sided p
Pair 1	Pre Test-Post Test	-5.571	1.785	.477	-6.602	-4.541	-11.678	13	<,001	<,001

Table 3. Paired samples test

The results of the paired sample t test on the aspects assessed by children between the pre-test and post-test, namely with an alpha significance level of 5%, obtained a calculated t value of -11,678 with a significance value of 0.01 which is less than alpha of 0. 05 then the decision that can be taken is to reject Ho and accept Ha, meaning that there is an influence on understanding the concept of heavy and light through weighing activities in children aged 5-6 years.

Understanding belongs to the cognitive realm where humans can think, understand, conclude, compare and reason. Cognitive development is the development of the mind. The mind is the thinking part of the brain. The parts used are for understanding, reasoning, knowledge and understanding (Mahdi & Ramadhini, 2020). In general, cognitive is defined as intellectual potential which consists of the stages: knowledge, understanding, application, analysis, synthesis, evaluation. Cognitive can be understood as a child's ability to think more complexly and the ability to reason and solve problems (Zega & Suprihati, 2021). Early childhood cognitive development is the development of children's thinking abilities and intelligence in understanding the surrounding environment, learning new things, developing memory, imagination and the ability to solve problems (Izzati & Yulsyofriend, 2020). That someone is said to understand a concept if they can organize and rephrase it according to what they have obtained or learned previously (Deliany et al., 2019). Understanding concepts is not just by memorizing but by studying concrete examples so that students are able to define information for themselves (Kholidah & Sujadi, 2018).

Understanding the concept of light weight is a child's ability to differentiate between objects when weighed. The ability to recognize the concept of light weight of objects is a child's ability or ability to know and differentiate between objects that have a lot of pressure when weighed and objects that have little pressure when weighed (Setyaningsih, 2020).

Understanding concepts is a child's ability to master learning material which is realized through his ability to understand, interpret and apply it according to his cognitive structure. Children can introduce and learn knowledge about simple science concepts through inquiry and experiment activities through learning through play (Kusumaswari et al., 2014).

The stage of getting to know the concept of heavier and lighter includes the stage of introducing the concept of measurement to children aged 3-6 years, according to Lestari KW, namely:

Children learn measurements from various opportunities through activities that require creativity. In the early stages, children do not use tools, but introduce the concepts of longer, shorter, lighter, faster and slower. The next stage, children are invited to use non-standard measuring tools, such as ribbons, shoes, etc. At a higher level, children are invited to use wall clocks, rulers, scales, thermometers (Lisa, 2017).

The benefit of being able to recognize the concept of heavy and light is the child's ability to be able to compare sizes using tools. Children compare quantities that are measured with measuring instruments, for example measuring the length of a table with a span, measuring the length of a blackboard with a ruler, measuring the mass of rice with a scale (Wulandari, 2016).

Scales function to determine the kilogram units for measuring a load. Scales can be divided into machine systems and digital systems. One example of a weighing system with a spring balance. A spring balance is a simple scale that uses a spring as a tool to determine kilograms of objects.

Digital scales are a type of scale that has a higher accuracy value than conventional (mechanical) scales (Ludya et al., 2023). To introduce concepts to young children, you can use Manipulative Scales media. Manipulative scales are a two-arm measuring instrument that has been manipulated by combining objects that are easily found around the child that can be seen, touched, heard and felt so that it has three functions in introducing the concept of measurement to children, namely length, volume and weight (Indarwati , 2016).

So, based on the types of scales that will be used in this research, they are manipulative scales and digital scales. Utilize the media of scales (artificial and real), Able to create a learning process that is fun and effective, and able to mobilize and grow the ability to think, reason, be able to draw conclusions, and make generalizations in children, so as to enrich children's knowledge with various experiences. can be used to satisfy their curiosity, imagine and translate their experiences into something meaningful for them (Hamid, 2013).

Closing

Before implementing the weighing activity, the researcher gave a pre-test. The pre-test is the initial observation of the child in recognizing the concept of heavy and light. With the prat-test, researchers can determine the child's initial abilities before treatment is applied. The results of the pre-test show that not all children can differentiate the concepts of heavy and light, from the 3 (three) indicators used, namely: the indicator of recognizing differences based on size: "more than". Indicator recognizing differences based on size: "less than" Indicator recognizing differences based on size: "most/ter". The learning process given to children through weighing activities was declared successful in providing an understanding of western and light concepts to children aged 5-6 years, because the results obtained were in line with the researchers' expectations. The results of the Paired Samples Test showed that the calculated t value was -11,678 with a significance value of 0.01 which is less than alpha of 0.05, so the decision that can be taken is that there is an influence on understanding the concept of heavy and light through weighing activities in children aged 5-6 year.

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