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THE EFFECT OF CUISSENAIRE BLOCK ON STUDENT'S MOTIVATION OF LEARNING MATHEMATICS AMONG FIRST GRADERS AT BRANGGAHAN KEDIRI PRIMARY SCHOOL

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ABSTRACT

The purpose of this study was to determine the effect of using Cuissenaire blocks on first grade students at Branggahan school in Kediri Regency's motivation to learn mathematics. This is a pre-experimental study with a single group pretest-posttest design. The population of this study consisted of all 47 students in class I Academic Year 2020/2021. Using a cluster random sampling technique, the sample consisted of 23 students in class 1B. The mathematics learning motivation scale was used to collect data for this study. The paired sample t-test was used to analyze the data in this study. The study's findings indicated that using Cuissenaire blocks had an effect on the mathematics learning motivation of first grade students at Branggahan school in Kediri Regency, with a tcount of 4.861 > 1.717 (p = 0.000). Additionally, students' motivation to learn mathematics was low (43.5%) prior to using cuissionar blocks, but increased (60.9%) after using cuissionar blocks. Thus, the use of cuissenaire blocks fosters an interest in mathematics. According to the research findings, the use of Cuissenaire blocks can be used as a supplement to traditional learning media, thereby increasing students' motivation to learn mathematics in particular.

Keywords: *Cuissenaire Block, Learning Motivation, Mathematics*

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INTRODUCTION

Education prepares each individual to contribute to nation building; thus, education is critical for the advancement of Science and Technology (IPTEK). Though since education is a platform for enhancing and developing the quality of learning for every human being, it must be expanded and developed in a systematic manner. Learning is critical for humans because it enables abilities and all expectations to be complied. According to Prawira (2014), the learning process occurs when someone exhibits different behavior than when they have not gone through the process. The success or failure of a learning endeavor is contingent upon the learning process that each human being undergoes.

There are two types of factors that affect a person's success in learning: external factors (which originate from outside humans) and internal factors (from within students). Learning to motivate oneself is one of the factors that can affect success, as motivation is a concept that explains why someone behaves in a certain way. Without motivation, it is indeed difficult to achieve optimal success in learning. In simplified way, if children lack motivation to learn, they will struggle to participate actively in the learning process. According to Kompri (2016), motivation is a person's strength that can result in a certain level of activity when performing an activity. It can come from within the individual (intrinsic motivation) or from outside the individual (extrinsic motivation) (extrinsic motivation). With motivation, students' passion can be lifted during their learning activities (Mardianto, 2012).

Childhood is referred to as the most active period because children are more receptive to environmental stimuli during this time. Their high level of curiosity will motivate them to take action in order to learn something. Psychologists such as Piaget, Bruner, Brownell, and Dienes believe that when we teach, we must take into account the students' level of thinking development (Ramlah, 2010). Jean Peaget's theory of children's mental development / theory of the level of development of children's thinking divides children's thinking into four stages: the sensorimotor stage (from birth to age two years), the initial operational stage / preoperative stage (ages two to seven years), the concrete operational stage (ages seven to eleven or twelve years), and formal operations (ages 11 and up).

Russell defines mathematics in Uno (2011) as a deductive, axiomatic, formal, hierarchical, abstract, meaningful language of symbols and the like. Due to these distinctions in characteristics, a teacher's unique ability is required to transition children who have not thought deductively into deductive ones. Mathematics education in elementary school is a study that is always interesting to conduct due to the unique differences between the natures of children and mathematics. Even at the pre-concrete stage, elementary school-aged children exhibit a formal thinking stage. Students at the pre-concrete stage understand the law of conservation, but they are unable to reason deductively, and thus do not understand how mathematical propositions are proved. Thus, children of elementary school age require tools or learning media to assist them in comprehending a subject.

According to the findings of interviews with teachers at SDN Branggahan, teachers continue to deliver content via the lecture method, without the use of supplementary instruments such as learning media. As a result, students recognize that the content is difficult and monotonous This is reinforced by the fact that many students, particularly in class I, are still unable to perform simple addition and subtraction calculations. Additionally, when learning occurs, students are less enthusiastic about participating in lessons; according to them, they are monotonous in their explanations, which causes students to lose enthusiasm and become bored, allowing them to interact

with their classmates and focus less on the information presented. This reflects students' low motivation to learn, which is possible as a result of the teacher's teaching method of delivering less attractive content that does not foster student motivation. As a result, it is necessary to create a pleasant learning environment that fosters creativity and student activity in order for students to develop. To enhance student learning activities, it is necessary to monitor students' levels of motivation, as motivated students can develop activities for carrying out learning activities.

Ningsih and Purwanto's (2015) research reveals the media's use. The findings of this study are corroborated by Restanti's (2015) research, which demonstrates that when children are motivated to learn, their willingness to learn increases. Thus, factors that motivate children to learn are required in education, one of which is the use of learning media to alleviate boredom associated with monotonous learning. According to Ningsih and Purwanto (2015), incorporating learning media into the learning process can foster new desires and interests, motivate and stimulate students' learning activities, and even have a psychological effect on students. The use of appropriate and diverse media will serve as a motivating tool in school-based teaching and learning activities. Cuissenaire block media is one type of media that can be used in early childhood.

Sardiman (2010) suggests that external stimuli can be used to stimulate motivation to learn. As an example, the use of Cuissenaire blocks motivates children to learn because the rods are colorful and extremely useful for explaining the concept of numbers, arithmetic operations, and their properties. According to Prihatini and Christiana (2014), Cuisenaire block media is a type of instructional media that enables children to conceptualize color and shape in concrete terms. According to Sudono (2006), the cuisenaire block is a game platform for the elementary education level; this tool can assist students and has numerous benefits. According to Eliyawati (2005), George Cuissenaire created cuissenaire blocks to help children develop their numeracy skills, number recognition, and reasoning abilities.

This is supported by Astuti's (2018) research, which demonstrates that the cuisenaire block media has an effect on early childhood numeracy skills. This is because with the cuisenaire block, children can easily recall the symbols for numbers 1-10, can match numbers to number symbols, and can easily recall the results of addition and subtraction of objects up to ten while still under the guidance of the teacher. Cuisenaire blocks assist children in grouping objects by color and sorting them according to high-low or vice versa, making math more enjoyable. By making students happy, we can increase their motivation to learn mathematics, because learning motivation is the overarching driving force in students that generates learning activities, ensures their continuity, and provides direction for learning activities in order to accomplish the subject's objectives. Considering the aforementioned, the researcher is interested in determining the effect of using Cuissenaire blocks on the mathematics learning motivation of first grade students at SDN Branggahan in Kediri Regency.

METHODOLOGY

This was a pre-experimental research with a single group pretest-posttest design. The population of this study consisted of all 47 students in class I of Branggahan primary school Academic Year 2020/2021. Using a cluster random sampling technique, the sample consisted of 23 students in class 1B. The data in this study were primary data, as they were collected directly from respondents. The data collection instrument in this study was a 33-statement mathematics learning motivation scale that has been validated for validity and reliability to ensure that it is suitable for use as a research instrument (Sukardi, 2013). The validity test results indicate that the rcount value of 33 items on the

scale of statement of motivation to learn mathematics was 0.404. As a result, the instrument for measuring motivation to learn mathematics is valid. Based on the results of the reliability coefficient calculation, r11 = 0.953 was obtained for a total of 33 items. As a result, the statement of motivation to learn mathematics has a high reliability coefficient.

The descriptive and inferential methods of data analysis were used in this study. The data on students' mathematics learning motivation are described using descriptive analysis, specifically by calculating the average, standard deviation, minimum and maximum values and classifying students' mathematics learning motivation into three categories, namely: high mathematics learning motivation if X M + 0,5 SD, moderate mathematics learning motivation if M – 0.5 SD X M + 0.5 SD, and moti (Sudijono, 2009). Hypotheses were tested using inferential analysis and the paired sample t-test. Prior to conducting the paired sample t-test, certain conditions must be met, including that the data being analyzed be normally distributed and homogeneous (Arikunto, 2013).

FINDINGS

Description of Students' Mathematics Learning Motivation

The research data were analyzed descriptively using the SPSS 24 For Windows program to obtain a description of the students' motivation to learn mathematics before and after using cuissionar blocks. The following table summarizes the results of descriptive statistics on mathematics learning motivation prior to and following the use of cuissionar blocks.

Table 1
Descriptive Statistical Results of Students' Mathematics Learning Motivation Before and After Using Cuissionar Blocks

Scale	N	Minimum	Maximum	Mean	Std
Learning Motivation Pretest	23	37	78	55,1304	9,14680
Learning Motivation Posttest	23	38	88	64.4783	11.95776

According to Table 1, the average motivation of students to learn mathematics prior to using cuissionar blocks is 55.13, with a maximum of 78 and a minimum of 37. While students' average motivation to learn mathematics is 64.48, with the highest score of 88 and the lowest score of 38 following their use of cuissionar blocks.

The data on motivation to learn mathematics is then classified into three categories based on the results of the descriptive analysis, namely high, medium, and low. The categorization of motivation to learn mathematics before and after the use of cuissionar blocks is shown in Figure 1.

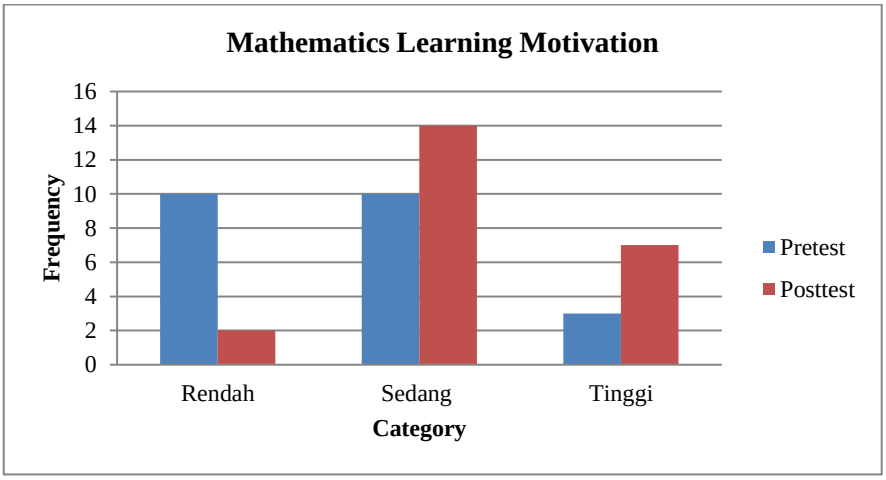

Figure 1. Motivation for Learning Mathematics of Students Before and After Using Cuissionar Block

According to Figure 1, prior to using the cuissionar block, students' motivation to learn mathematics, three students or 13 percent were categorized as high, ten students or 43.5 percent were categorized as moderate, and ten students or 43.5 percent were categorized as low. Thus, it can be concluded that the majority of students have a low motivation to learn mathematics prior to using the cuissionar beam.

After using the cuissionar block, students' motivation to learn mathematics was as high as seven students or 30.4 percent, as moderate as 14 students or 60.9 percent, and as low as 2 students or 8, 7 percent. Thus, it can be concluded that the majority of students' motivation to learn mathematics increases as a result of their use of medium cuissionar blocks. Thus, after using cuissionar blocks, students' motivation to learn mathematics increases.

Hypothesis Testing

Before testing the hypothesis, the prerequisite tests were carried out including the normality test and homogeneity test, the calculations of which were assisted by the SPSS 24 For Windows program. The results of the prerequisite test are as follows.

Table 2
Normality Testing Results

Variable	Stats	Significance (p)	Remark	Conclusion
Pretest	0,170	0,083	P > 0,05	Normal
Postest	0,167	0,096	P > 0,05	Normal

Based on table 2 shows that the distribution of pretest and posttest data on motivation to learn mathematics each has a statistical value of 0.170 and 0.167 with a significance of 0.083 and 0.096, respectively, where p-value is > 0.05 so it can be said to be significant (Widiyanto, 2013) . This means that the distribution of pretest and posttest data on learning motivation is normally distributed.

Table 3
Homogeneity Testing Results

Variable	Stats	Significance (p)	Remark	Conclusion
Pretest and Postest	0,691	0,410	P > 0,05	Homogenous

According to Table 3, the pretest and posttest data on motivation to learn mathematics have a statistical value of 0.691 with a significance of 0.410, indicating that they are significant. This means that the data on motivation to learn mathematics are homogeneous between pretest and posttest.

After establishing that the pretest and posttest data on motivation to learn mathematics were normally distributed and homogeneous, the paired sample t test was used to test the hypothesis (Paired Samples t Test). The purpose of this study is to determine whether or not using Cuissenaire blocks has an effect on the mathematics learning motivation of first grade students at SDN Branggahan in Kediri Regency. The paired sample t test (Paired Samples t Test) results are presented in Table 4.

Table 4
Paired Samples t Test Results

T_{count}	Df	t_{table}	Significance (p)	Remark	Conclusion
4,861	22	1,717	0,000	P < 0,05	H_a accepted and H_0 rejected

Based on table 4, it shows that the tcount value is 4.861 > 1.717 ttable with a significance value (p) of 0.000 <0.05, then H0 is rejected. This means that there is an effect of the use of Cuissenaire blocks on the motivation to learn mathematics among the first grade students at SDN Branggahan, Kediri Regency.

DISCUSSION

According to the results of hypothesis testing, there is an effect of using Cuissenaire blocks on the motivation of first grade students at Branggahan primary school in Kediri Regency to learn mathematics. Sudono (2006:36) defines cuisenaire blocks as ten-level blocks numbered one to ten. Cuisenaire blocks were invented by George Cuisenaire of Belgium in response to his observations of children's difficulty with mathematics. Even at the pre-concrete stage, elementary school-aged children exhibit a formal thinking stage. Students at the pre-concrete stage understand the law of conservation, but they are unable to reason deductively, and thus do not understand how mathematical propositions are proved. Thus, elementary school-aged children who are learning mathematics require tools or learning media to assist them in comprehending a subject.

Cuisenaire blocks are a type of game tool used in elementary education; these blocks can assist students and provide numerous benefits (Sudono, 2006:21). According to Eliyawati (2005:69), the cuisenaire block was created to help students develop their numeracy skills, number recognition, and reasoning abilities. Utilizing Cuissenaire Blocks assists children in memorizing symbols they will encounter later in algebra lessons. Children can experiment with "twisted relationships" (having a certain distance) using Cuissenaire blocks by creating flat patterns on a table or arranging them into

three-dimensional designs. They will soon discover how these blocks' combinations have the same length. This can assist children in grasping the concept of "symmetry".

Older children can concentrate more on the view of the block's length and record it on paper; this concept can assist children in visualizing the structure of a pattern and training them in arithmetic and geometric concepts. Additionally, students can match numbers to number symbols accurately and recall the results of addition and subtraction of objects up to ten, demonstrating their mathematical abilities. This is consistent with the findings of Astuti's research (2018:112), which demonstrate that the cuisenaire block media has an effect on early childhood numeracy skills. This is because with the cuisenaire block, children can accurately name the symbols for numbers 1-10, can match numbers to number symbols, and can mention the results of addition and subtraction of objects up to ten while still under the supervision of an adult.

According to the pretest results, students' motivation to learn mathematics was 43.5 percent low prior to using the cuissionar block, and their average motivation to learn mathematics was 55.13. However, after receiving mathematics instruction using cuissionar blocks, students' mathematics learning motivation increased, with 60.9 percent demonstrating moderate motivation and 30.4 percent demonstrating high motivation, for an average mathematics learning motivation of 64.48. This means that the use of Cuissenaire blocks can increase elementary school students' motivation to learn mathematics in grade 1.

The findings of this study are corroborated by Restanti's (2015) research, which demonstrates that when children are motivated to learn, their willingness to learn increases. Thus, factors that motivate children to learn are required in education, one of which is the use of learning media to alleviate boredom associated with monotonous learning. According to Ningsih and Purwanto (2015), incorporating learning media into the learning process can foster new desires and interests, motivate and stimulate students' learning activities, and even have a psychological effect on students. The use of appropriate and diverse media will serve as a motivating tool in school-based teaching and learning activities. Cuissenaire block media is one type of media that can be used in early childhood.

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Students were enthusiastic throughout the research process, specifically the application of cuissenaire blocks. They are overjoyed to be able to learn mathematics through play. By making students happy, we can increase their motivation to learn mathematics, because learning motivation is the overarching driving force in students that generates learning activities, ensures their

continuity, and provides direction for learning activities in order to accomplish the subject's objectives. The use of cuissenaire blocks can help students develop a stronger interest in mathematics.

CONCLUSION

The data analysis results indicate that using Cuissenaire blocks has an effect on the mathematics learning motivation of first grade students at Branggahan primary school, Kediri Regency. The use of cuissenaire blocks media can be a motivating tool in classroom teaching and learning activities, as cuissenaire blocks pique children's interest in learning while they play. By making students happy, their motivation to learn mathematics will increase. Thus, teachers may be advised to use Cuissenaire blocks as a supplement to traditional learning media in order to increase students' motivation to learn mathematics in particular. Thus, every educator is expected to employ not only traditional learning methods such as lectures, but also a variety of learning media that are relevant to the material being taught.

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