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The Effectiveness of Window Shopping-Based Inquiry Learning Model to Increase Science Argumentation Skills in Elementary School

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Abstract: The purpose of this study is the effectiveness of the Window Shopping-based inquiry learning model which is to improve argumentation skills in Natural Science Class 6 Elementary School, Bonang District. This study uses experimental research methods. The subjects in this study were the sixth-grade students of Gebang 1 State Elementary School, Bonang Demak, with a total of 34 students as the experimental class, and the sixth grade of Gebangarum 1 Demak State Elementary School with a total of 22 students as the control class. The results of the N-Gain score test showed that the experimental class (by applying the rotation model) obtained an average N-Gain score of 66.44% which was included in the 'Effective Enough' category. Meanwhile, the application of the conventional model in the control class resulted in an average N-Gain score of 39.30% categorized as 'Not effective. While the effectiveness test using the paired sample t-test is known that the significance value (2-tailed) is 0.000 <0.05. In addition to the significance value, the value of t count > from t-table is 38.152 > 2.035. From these results, it can be concluded that the application of the rotation model has a significant impact on student learning outcomes in science lessons for grade VI elementary school.

Keywords: Inquiry, argumentative skills, natural science

1. Introduction

Managing a class with a variety of fun and exciting teaching methods is an ability that today's teachers must possess when dealing with the millennial generation, so that the learning process can run effectively, dynamically and fun. Moore (2014) argues that the application of varied methods will help teachers to maintain the attention of students.

Understanding that students have different learning styles is an attractive offer for a teacher to elaborate on the conventional method or what is often termed as CTM (Lecture, Question and Answer Only) with a learning method called Window Shopping. Zumroh, Rahayu, & Dewi (2018) revealed that this window shopping model is very interesting. In addition to group work, there are peer tutoring activities. This learning model can be used to determine the level of student understanding and also provide training in the form of story questions related to other subjects as well as in everyday life. Athiyah (2022) that Window Shopping can be a means for students to add insight by going around to display the work of other groups. In line with this opinion

In general, critical thinking encompasses the capacity for self-evaluation and helps one become more independent in addition to being described as a profound thinking process (Alsaleh, 2020). In the intellectual process of critical thinking, the thinker utilises thoughtful, autonomous, clear, and reasonable thought while purposefully assessing the quality of his own reasoning. The ability to analyse, evaluate, and understand observations, facts, and arguments is a component of critical thinking (Fakhriyah & Masfuah, 2021). Learning natural sciences ideally can direct students to be able to argue or think at a higher level. One of the skills in high thinking is an argumentation skill based on concepts (Hasnunidah et al., 2020). Pratiwi et al. (2019), states the importance of practising argumentation skills in science learning so that students have logical reasoning, clear views, and rational explanations of the things being studied.

Based on the background that has been described, the researchers feel the need to develop an inquiry-based learning model that can be applied in the learning process for students. This research was conducted to meet the learning needs of

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the Window Shopping-based Inquiry model, Development of Window Shopping-based Inquiry model design, Feasibility of Window Shopping-based Inquiry model, the effectiveness of Window Shopping-based Inquiry model to improve natural science argument skills Grade 6 Bonang Elementary School.

2. Literature Review

The critical thinking process is one of the high-level thinking skills that learners need to have since it teaches them how to assess problems and find solutions in the field of science. The capacity to think critically can help us overcome challenges we are encountering and seek and build alternate solutions to the problem (Susilawati et al., 2020). Critical thinking abilities are crucial to have because they are required to confront the problems that life presents (Karim, 2015). In learning tasks including problem-solving in the classroom, decision-making, analytical skills, and scientific inquiry, critical thinking is a well-directed and clear process (Egok, 2016). Inquiry learning is one of the approaches that can help with critical thinking because the learning activities require students to be able to look into and find information specifically connected to the subject matter in order to come up with their own invention (Spronken-Smith et al., 2012). This instruction places a strong emphasis on the discovery process, which can motivate students to actively engage in their studies and develop their thinking skills, particularly their capacity for critical thought.

Inquiry is one way of learning or studying that seeks to solve problems in a critical, analytical, and scientific way by using certain steps towards a convincing conclusion because it is supported by data or reality. Inquiry is a technique or method used by teachers to teach in front of the class (Barron & Darling-Hammond, 2010). The implementation is that the teacher divides tasks among students to examine a problem in class. Students are divided into several groups, and each group gets a specific task. They study, research, or discuss their work in groups. After that, they discussed it and made a report. By using this technique, the teacher has a goal, namely so that students are encouraged to carry out tasks and actively seek themselves and research problem-solving (Raes et al., 2012).

Chen et al. (2014) Window Shopping is a sightseeing activity, both looking at goods in stores and elsewhere. For example, when walking in the mall while looking at the goods behind the window. People who do eyewash in shops may feel happy just by imagining buying goods or just knowing the price of these goods (Hajar, 2018). Students participate in Window Shopping by learning alongside other groups as well as within their own groups. Students move throughout the classroom to engage in creative discussion with other groups on the subject rather than simply sitting in their chairs. With the windows shopping approach, the teacher divides the class into various groups and then assigns various instances or conversations to each group. Then, depending on the topic chosen, each group completes the assignment or has a discussion. Students study in their separate groups during Window Shopping while also learning with other groups. Instead of just sitting in their seats, students actively move around the classroom to engage in discussions with other groups regarding the topic (Prasetyo, 2021). Students must actively share their ideas and new knowledge with other individuals or groups.

The 2013 curriculum requires pupils to actively participate in their learning. In accordance with Piaget's theory of development, children who participate in classroom learning acquire knowledge that has been deeply ingrained. Therefore, educators need to design a learning method that may help students strengthen their thinking skills (Kurniasari, 2017). The way arguments are presented orally and in writing can reveal a person's conceptual grasp and reasoning. As a result, one can judge someone's understanding by the way they write their argument. Argumentation refers to Toulmin's argument theory called Toulmin's Argument Pattern (TAP). The argument components in Toulmin's theory include claim (statement of position), data or reality, warrant (the connection between claim and data), backing (supporting warrant), a modal qualifier (modality framework), and rebuttal (exception or rebuttal) (Handayani, 2015).

3. Methodology

This research is included in the type of research with research and development (R&D) methods. The process of developing educational equipment, known as development or research and development (R&D), is carried out through a series of studies employing different methodologies in a cycle that goes through several stages. The R&D approach is research that is utilized to create specific items and evaluate their efficacy (Marcus et al., 2013). The R&D technique tries to contribute to an understanding of scientific basics while also focusing on improvement in the design of the learning environment, curriculum development, and evaluation of the effectiveness of observation and learning.

This study used a quantitative approach, which is a way of learning by using numerical data as a tool to examine information about what you're interested in learning. In order to assess the results, this research approach converts the data into numbers. The quasi-experimental approach is a research technique that use pre-existing groups rather than random assignment.

The population of this study was 760 and the sample consisted of 34 student grade 6 from five elementary schools in Bonang sub-district, Demak Regency. Researchers used sampling to select subjects due to the limited time allowed by the principal of the selected primary school. To conduct research, the permit has been approved by the superintendent and principal.

4. Findings and Discussions

In this study, the experimental class used learning with a window shopping-based inquiry model. This experiment was carried out in class VI of Gebang 1 State Elementary School, Bonang District, Demak Regency. There were 34 students in this experiment. After the post-test was carried out, the score distribution of 30 multiple-choice questions was obtained. The results of this distribution were carried out by descriptive analysis, namely analysis using statistical methods to obtain patterns of several studies, summarize them, and continue to present information in the desired form.

4.1 List of Frequency Distribution

From the results of the post-test, the following data were obtained:

Table 1. Results of post-test scores for experimental class with a window shopping-based inquiry model

No.	Score	Tabulation	Frequency	Value x frequency
1	70	/	1	70
2	73	//	2	146
3	77	/////	5	385
4	80	///// /	6	480
5	83	///	3	249
6	87	/////	5	435
7	90	//	2	180
8	93	//	2	186
9	97	//	2	194
Amount			**28**	**2325**

4.2 Mean, Median, and Mode

From the analysis of the experimental class post-test data

$$\text{Mean} = \frac{amount\ of\ data}{amount\ of\ students\ follow\ test} = \frac{2325}{28} = 83{,}03$$

Median = 81.5
Most mode or score = 80

4.3 Mastery Learning

The minimum completeness criteria of science lesson content of 70, means that students who get a score of more or at least 70 are 31 students. A total of 3 students scored below 70. This shows that 91% of the sixth-grade students of Gebang 1 State Elementary School, Bonang District (experimental class) have reached the minimum completeness criteria limit. The remaining 9% of students have not finished studying

$$Mastery\ learning = \frac{Amount\ students\ who\ pass}{Total\ student\ completed}\ x\ 100\% \quad (1)$$

$$= \frac{28}{28} x\ 100\% = 100\%$$

4.4 N-Gain Score Test

The results of the calculation of the N-gain score test, Table 2 shows that the average value of the N-gain score for the experimental class (window shopping-based inquiry model) is 71.8796 or 71.88%. Meanwhile, the average N-gain score for the control class (conventional method) is 39.3037 or 39.30%. To see the effectiveness of the application of the window shopping-based inquiry model, then the average value of the N-gain score is classified according to its categorization.

Table 2. N-Gain score test results for the experimental class and control class

No.	Class	Average N-Gain score (%)	Information
1	Experiment (window shopping-based inquiry model)	71.88	Effective

2	Control (conventional method)	39.30	Ineffective

Source: Results of SPSS data processing 23

From e table, it can be concluded that the application of the window shopping-based inquiry model in the experimental class (learning using a window shopping-based inquiry model) resulted in an average N-gain score of 66.44 or 66.44% categorized as 'Effective'. Meanwhile, the application of the conventional model in the control class resulted in an average N-Gain score of 39.30 or 39.30% categorized as 'Ineffective'.

Analysis of the effectiveness test using the t-test on student learning outcomes in schools that apply the window shopping-based inquiry model with schools that do not apply the window shopping-based inquiry model with the following hypothesis.

Ha : There is a significant difference between students who apply and those who do not apply the window shopping-based inquiry model.

H0 : There is no significant difference between learning that applies and those who do not apply the window shopping-based inquiry model.

The test criteria used are if the significance value is <0.05, then Ha is accepted and H0 is rejected. Significance value > 0.05 then Ha is rejected and H0 is accepted. In addition to using the significance value, a comparison is also used between the calculated t-value and the t-table. If the value of t-count > t-table then Ha is accepted and H0 is rejected. If the value of t count < t-table, then Ha is rejected and Ho is accepted. The results of the data analysis of the effectiveness of the application of the window shopping-based inquiry model in science learning can be presented in the following Table 3.

Table 3. Test results paired sample t-test

		Paired Differences					**t**	**df**	**Sig. (2-tailed**
		Mean	**Std. Deviation**	**Std. Error Mean**	**95% Confidence Interval of The Difference**				
					Lower	**Upper**			
Pair 1	Pre-test Experiment 1 Post-test Experiment 1	43.429	8.839	1.670	40.002	46..855	26.002	26.002	.000
Pair 2	Pre-test Experiment 2 Post-test Experiment 2	37.029	5.569	.971	35.055	39.004	38.152	38.152	.000

Based on the results of the t-test analysis, it was found that the significance value of the two experimental schools was 0.000. This significance value is less than 0.005. Thus the t-test results with paired sample t-test show a significance value of 0.000 <0.005. Referring to the testing criteria that if the significance value <0.05 then Ha is accepted and Ho is rejected. This means that Ha in this study is accepted and H0 is rejected. Meanwhile, the t-count in this study obtained a value of 26.002. Furthermore, the t-table value is searched based on the df value. The df value from the table can be seen at 27 so the t-table value is 2.052. Thus, the value of t-count> t-table is obtained, namely 26.002> 2.052. From these results, it can be concluded that there is a significant difference between learning that applies and those who do not apply the Inquiry Model based on window shopping.

5. Conclusions and Recommendations

The conclusion of this study is that the effectiveness of the Inquiry learning model based on windows shopping can be seen from the results of the N-Gain score test. The result is the experimental class (by applying the Inquiry Model based on window shopping). The average percentage of the N-Gain score is 66.44%. categorized as 'Sufficiently effective'. Meanwhile, applying the conventional model to the control class, the average N-Gain score of 39.30% was categorized as 'Not effective. While the effectiveness test using the paired sample t-test is known that the significance value (2-tailed) is 0.000 <0.05. The results of t arithmetic in the experimental class also showed a value greater than the t-table, namely 38.152 > 2.035. These results indicate that Ha is accepted and Ho is rejected, which means that there is a significant difference between student learning outcomes in the pre-test and post-test. From the results, it can be concluded that the application of the Inquiry Model based on window shopping has a significant impact on student learning outcomes in science lessons for grade VI elementary school.

The learning model is a representation or strategy that teachers and students utilise to accomplish educational objectives using a systematic pattern or procedure. In order to create a joyful learning environment, Windows shopping as a learning paradigm encourages students to be more involved in both discussing and providing material as peer tutors

to other friends. In the learning process, it is considered that students have the flexibility to roam around and view the work of other groups in order to give them fresh experiences that will help them grow their work.

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Conflict of Interest

The authors declare no conflicts of interest.

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