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Quantum Teaching Learning Model To Improve Students' Activities And Learning Outcomes In Chapter 4 Changing Form Of Energy Class Iv Sdn Sidodadi 01 Tempurejo District Jember Regency

Pungky Guruh Maulana [1], Agustiningsih [2], Kendid Mahmudi [3]

Primary School Teacher Education, Jember University, Tegal Boto Campus, Jl. Kalimantan No.37, East Krajan, Sumbersari District, Jember Regency, East Java 68121

pungkymaulana2@gmail.com

Abstract*: This research was motivated by the many complaints from teachers regarding the learning activities that students must achieve in each subject that uses the independent curriculum. The aim of this research is to improve the learning activities and learning outcomes of students through the application of the Quantum Teaching model for class IV students in Chapter 4 Changing Forms of Energy. This type of research is Classroom Action Research or PTK. The subjects of this research were all fourth grade students at SDN Sidodadi 01 Jember district. The data collection methods used were observation, interviews and tests. The results obtained in using the Quantum Teaching model are very satisfying, where learning becomes effective and makes students active. The results obtained in this research are the average classical scores of class IV students at SDN Sidodadi 01 Jember in each cycle. The first cycle, namely Student Activities, cycle I had a score of 63.25%, then in cycle II, Student Activities had a score of 77.5. Cycle II obtained the results of class IV learning activities in cycle II, there were two qualifications with the same number of students, namely 10 students or 50% of the 20 students with very good qualifications. Furthermore, there are 6 or 30% of the 20 students with sufficient qualifications. In terms of qualifications, there is 1 student or 5% of 20 students. Finally, of the 20 students, 1 student or 5% received very poor qualifications. Continuing to calculate the average overall score in cycle II using the Quantum Teaching model, the average score was 77.5. This score has sufficiently met the target, namely ≥75. So the results of cycle II have increased from cycle I to cycle II at SDN Sidodadi 01 Jember.*

Keywords: Quantum Teaching Model, student activities, student learning outcomes

1. INTRODUCTION

In the world of Indonesian education, each era's journey always brings progress. This can be seen from the continued implementation of various policy efforts by the government. In relation to this policy, the Indonesian government provides compulsory education programs and provides scholarship support to underprivileged communities. Apart from that, in order to improve the quality of education, efforts are being made to implement several things that are part of the policy program. Currently, several policies have been issued by the government which invite public discussion, this is related to the "independent learning" curriculum. This has become a hot topic of discussion, apparently this program was realized with the National Examination policy since 2021 being abolished and replaced with an assessment system (Minimum Competency Assessment) and Authority Characteristics Survey (2019).

There are several things that are closely related to the specified system so these things must be implemented correctly. The established system will be implemented well if there is a form of firmness in it. Therefore, a mental revolution must be carried out so that each individual is able to carry out responsibility in efforts to improve the quality of education. Merdeka Belajar is a program to create a happy learning atmosphere at school, a happy atmosphere, happiness for students and teachers. The learning behind the launch of the Merdeka Belajar program is the many complaints from parents about the national education system that has been in effect so far, including the minimum completeness scores that students must achieve which are different in each subject. Freedom to learn is one form of policy adjustment to restore the increasingly forgotten essence of assessment. The concept of Freedom to Learn is to return the national education system to the essence of the law by giving schools freedom to interpret the basic competencies of the curriculum as an assessment by the GTK Secretariat (2020).

In the independent curriculum, natural science learning is integrated with social science to become science. The objectives of learning sciences in this curriculum are to develop interest and curiosity, play an active role, develop inquiry skills about oneself and one's environment, and develop knowledge and understanding of scienceas concepts. In this way, students are not only objects of learning, but also subjects of learning. Therefore, teachers must carefully prepare and plan learning that can develop students' understanding and process skills. To support this achievement, it is necessary to develop teachers, in order to form professional teachers. One of the efforts that has been made is for the government to provide teachers' books. The teacher's book contains material content and learning

strategies which serve as a guide in implementing independent curriculum learning. Fadhilaturrahmi (2017) stated that the scientific approach must also be balanced with the use of learning models that are innovative, varied, can increase activity and shape the character of students. The statement above can provide knowledge that teachers must be able to invite students to examine and learn the values contained in each subject that are useful in social life.

Based on the results of observations of class IV students at SDN Sidodadi 01 in January 2023 with a total of 20 students, they obtained information from the teacher that the problems that occurred in learning were still carried out using the lecture method and students were passive, the use of media was less, and it was still centered on the teacher. so that student grades and student learning activities in class are less active. This results in students participating less in learning activities which makes students feel bored and lack concentration when studying. As a result of this learning, student activities and learning outcomes are less than optimal, grades are low, and some students even find it difficult to do assignments in a haphazard way. This can be seen from the students' daily test scores which are still not enough to reach the minimum science completion criteria (KKM) standard which is determined to be ≥ 70.

So the solution to this is the use of learning methods that can anticipate and improve low student grades and the activities of students who are required to be active in learning, namely using the Quantum Teaching learning model. Mikaningsih (2021:785), the application of the Quantum Teaching learning model as a meaningful learning alternative that leads to active, creative, effective and fun learning. Mahananingtyas (2016:17), also explains that Quantum learning is a learning method that makes teaching and learning activities comfortable and enjoyable, so that it is easier for students to discover new knowledge. Then according to Riyanto (2018:47), Quantum Teaching is a learning model which is an orchestration of various interactions (including elements of effective learning that influence student success) that exist in and around the learning moment. So Quantum Teaching creates an effective environment, by using elements in students and their learning environment through interactions that occur in the classroom. Based on this background, research was conducted entitled "Application of the Quantum Teaching Learning Model to Improve Student Activities and Learning Outcomes in Chapter 4 Changing Forms of Energy Class IV SDN Sidodadi 01 Tempurejo District, Jember Regency"

2. METHOD

The type of research used in this research is Classroom Action Research or PTK. This research is an action step to improve the quality of learning practices and to see its effect on learning outcomes. The Classroom Action Research that will be carried out is to deal with problems in the class such as low activity and learning outcomes for class IV students at SDN Sidodadi 01. This research design uses two cycles, this is planned so that the learning process can experience an increase in both learning activities and learning outcomes.

The implementation of this research began with initial observations carried out before the implementation of cycle I which aimed to determine the initial learning conditions of students. In the initial observation, the data required during the research was collected, such as the names of students and student learning outcomes before implementing the cycle. In this initial observation activity, several activities were carried out as initial steps for the research, namely as follows.

a. Interview activities were conducted with class IV teachers at SDN Sidodadi 01 regarding learning methods or models that are often used in class, teachers' opinions regarding the Quantum Teaching model, as well as problems with student activities and learning outcomes.
b. Observations were carried out in class IV during learning activities to determine students' learning conditions and further information regarding learning problems, as well as observing activities carried out by teachers and students during learning.
c. Class IV data collection activities in the form of names of students and data on learning results for mid-semester tests at SDN Sidodadi 01 odd semester 2022/2023.

3.3.2 Implementation of Cycle I

The implementation stages in cycle I include planning, implementation, action, observation and reflection as follows.

a. Planning

1) Determine the material that will be used in the learning process.
2) Develop a class IV learning module in Chapter 4 Changing Forms of Energy using the Quantum Teaching learning model.
3) Prepare a Group Worksheet (LKK)
4) Develop observation sheet guidelines
5) Create final cycle written test questions along with answer keys.

b. Implementation of Actions

At this stage, implement the learning design that has been prepared according to the learning module and carry out teaching and learning activities that apply the Quantum Teaching learning model.

c. Observation

This observation activity is carried out simultaneously with the implementation of classroom actions by observing students' learning activities in accordance with the observation sheet guidelines. In observation activities, researchers are assisted by other observers to observe the progress of learning activities.

d. Reflection

The reflection stage is carried out to analyze the results of actions during the teaching and learning process. This aims to determine the results achieved by students as well as the obstacles students face during learning activities using the Quantum Teaching learning model.

3.3.3 Implementation of Cycle II

The procedure used in cycle II is the same as cycle I. In its implementation, cycle II is used as improvement or stabilization, so that things that were deficiencies in the

previous cycle will be corrected in cycle II to achieve more optimal results. If cycle I is deemed successful, cycle II will be implemented as reinforcement. However, if cycle I is deemed unsuccessful, cycle II is carried out to improve the results of the previous cycle.

3.7.1 Analysis of Student Learning Activities

The percentages used in calculating the average increase in learning activities of class IV students at SDN Sidodadi 01 during learning activities using the Quantum Teaching model are as follows.

$$Pa = \frac{A}{N} x\ 100\%$$

Information:
Pa = Percentage of student learning activities
A = Total score achieved by students
N = Number of students

To find out the percentage of student learning activities obtained, the benchmark criteria for student learning activities are as shown in table 3.1 as follows.

Table 3.1 Criteria for Student Activities

No	Percentage Range	Criteria for Percentage of Learning Activities
1	$80 \leq Pa \leq 100$	Very Active
2	$60 \leq Pa < 80$	Active
3	$40 \leq Pa < 60$	Active enough
4	$20 \leq Pa < 40$	Less Active
5	$Pa < 20$	Very Inactive

Source: Agustina (2016)

3.7.2 Analysis of Student Learning Results

Management of learning outcome values is the value of learning outcomes in the cognitive domain. The average learning outcomes of individual students can be calculated using the following formula.

$$Pi = \frac{\Sigma srt}{\Sigma si} x\ 100$$

Information:
Pi = Average individual learning outcomes
Σ srt= Total score of learning outcomes achieved by the individual
Σ si = Number of Students

To find out the average student learning outcomes obtained, the benchmark criteria for student learning outcomes are as in table 3.2 below.

Table 3.2 Criteria for Student Learning Outcomes

No	Score Range	Learning Outcome Score Criteria
1	$P \leq 100$	Very good
2	$80 \leq P < 90$	Good
3	$65 \leq P < 80$	Pretty good
4	$55 \leq P < 65$	Not good
5	$P < 35$	Very Not Good

Sulthon Mashhud, M (2016)

4. RESULTS AND DISCUSSION

In data analysis, it can be explained about the analysis of critical thinking skills and student learning outcomes from before the action and after taking the action, namely by implementing the pre-cycle, cycle I and cycle II.

4.3.1 Analysis of Student Learning Activities

a . Analysis of Student Learning Activities cycle I

Based on the analysis of student worksheets, the results of the learning activities of class IV students at SDN Sidodadi 01 Jember are obtained in table 4.2 below.

Table 4.2 Results of Cycle I Student Learning Activities

Criteria	Frequency	Percentage (%)
Very Active	2	10
Active	4	20
Active enough	4	20
Less Active	7	35
Very Inactive	3	15
Amount	**20**	**100**

The results of increasing student learning activities from cycle I can be seen in diagram 4.1 below.

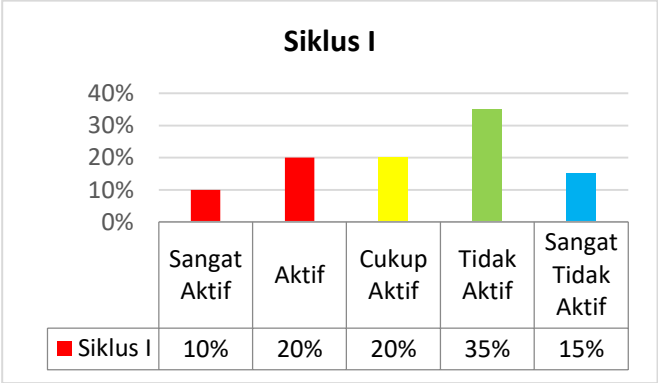

Figure 4.1 Percentage Diagram of Cycle I Student Learning Activities

In table 4.2, the results show that 2 students or 10% of 20 students scored in very good criteria. In the good score range, 4 or 20% of 20 students were obtained. Furthermore, out of 20 students, 4 or 20% of students got sufficient score criteria. Next, in terms of qualifications, there are 7 students or 35% of the total class, namely 20 students. Finally, there were 3 students or 15% of the 20 students in class IV who received very poor criteria. Based on the results obtained by students, it shows that there has been a fairly good increase in student learning activities through the application of the *Quantum Teaching learning model.*

b . Analysis of Student Learning Activities cycle II

Based on the analysis of students' worksheets, the results of the learning activities of class IV students at SDN Sidodadi 01 Jember are obtained in table 4.3 below.

Table 4.3 Results of Cycle II Student Learning Activities

Criteria	Frequency	Percentage (%)
Very Active	10	50
Active	6	30
Active enough	2	10
Less Active	1	5
Very Inactive	1	5
Amount	**20**	**100**

The results of increasing student learning activities from cycle II can be seen in diagram 4.2 below.

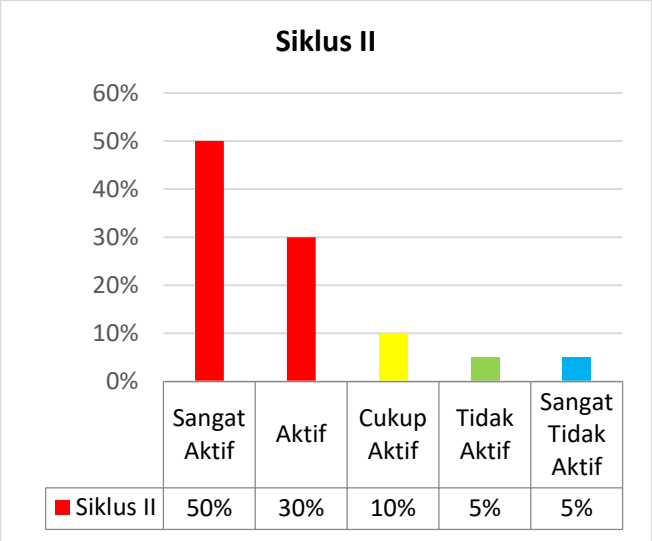

Figure 4.2 Percentage Diagram of Cycle II Student Learning Activities

In table 4.3, the results show that 10 students or 50% of the 20 students scored in the very good criteria. In the range of good scores obtained 6 or 30% of 20 students. Furthermore, out of 20 students, 2 or 10% of students got sufficient score criteria. Next, in terms of qualifications, there is less than 1 student or 5% of the total class, namely 20 students. Lastly, 1 student or 5% of the 20 students in class IV received very poor criteria. Based on the results obtained by students, it shows that there has been a fairly good increase in student learning activities through the application of the *Quantum Teaching learning model.*

3.2.2 Analysis of Student Learning Results

a. Analysis of cycle I student learning outcomes

Data from the analysis of students in cycle I received an average learning outcome score in table 4.4 as follows.

Table 4.4 Cycle I Student Learning Results

Criteria	Frequency	Percentage (%)
Very good	4	20
Good	3	15
Pretty good	5	25
Not good	7	35
Very Not Good	2	10
Amount	**20**	**100**

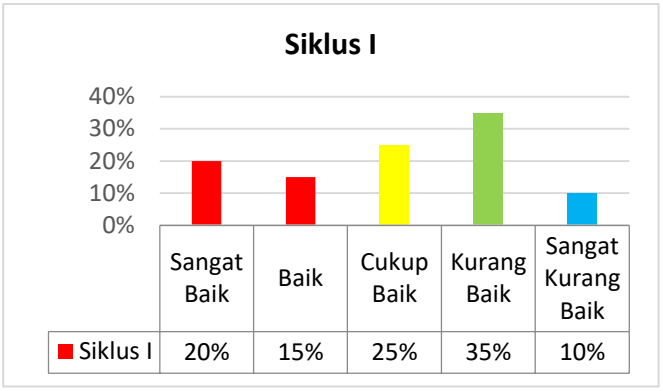

Figure 4.4 Percentage Diagram of Increase in Cycle I Student Learning Outcomes scores

Based on the learning results presented in the table above, the results obtained were that in the very good classification there were 4 students or 20%, then there were 3 students or 15% with good criteria, 5 students or 25% with fairly good criteria, 7 students or 35% with poor criteria, 2 students or 10% with very poor criteria.

b. Analysis of student learning outcomes in cycle II

In the second cycle of research that has been carried out, data on learning outcomes for class IV students at SDN Sidodadi 01 Jember can be obtained which are presented in table 4.5 below.

Table 4.5 Cycle II Student Learning Results

Criteria	Frequency	Percentage (%)
Very good	10	50
Good	7	35
Pretty good	2	10
Not good	1	5
Very Not Good	0	0
Amount	**20**	**100**

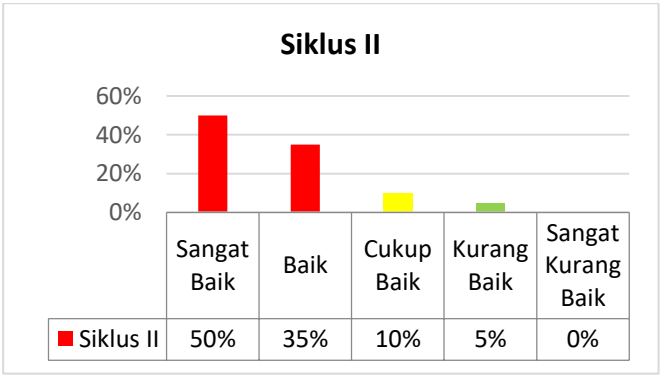

Figure 4.5 Percentage Diagram of Increase in Cycle II Student Learning Outcomes scores

After carrying out the second cycle of research, the results can be seen as in the table above. First, 10 students or 50% got very good qualifying scores. Furthermore, there were 7 students with good qualifications with a score of 35%. Then the qualifying score is good enough for 2 students or 10%. There is 1 student or 5% of the students with a poor qualification score, and very low qualifications, namely 0%.

Based on the results of activities and student learning outcomes in cycle I, they are included in the sufficient category. The average result of class IV student activity in chapter 4 Changing Forms of Energy was 63.25, which was included in the sufficient category. Meanwhile, the average learning outcome is 64.8 or can be categorized as sufficient, where 6 students or 30% got scores above the KKM and 14 students or 70% still got scores below the KKM. Furthermore, with data analysis in cycle II, the average activity results for class IV students were 77.5 in the good category. Furthermore, for student learning outcomes in cycle II, an average of 77.5 was obtained in the good category. In these average results, there has been an increase in student activity scores from cycle I to cycle II with a difference of 14.25 and the average student learning outcomes have a difference of 12.7. The increase in student activity and class IV learning outcomes in chapter 4 Changing Forms of Energy is influenced by the similarity of the models for each question in the final test, so that students are able to understand and interpret the questions given in cycle I and cycle II.

4. Conclusion

Quantum Teaching model in class IV in chapter 4 Changing Forms of Energy can increase students' learning activities. There was an increase in student learning activities from cycle I to cycle II. In cycle I, the average obtained was 63.25, which was considered sufficient. Cycle II showed an average increase of 14.25 to 77.5 and was classified as good qualifications. Then, applying the *Quantum Teaching model* to class IV students, chapter 4 Changing Forms of Energy, can achieve an increase in student learning outcomes. The average at the pre-cycle stage is 60, which is in the sufficient category and there are still many students who get scores below the KKM. In cycle I there was an increase from pre-cycle with a classical average of 64.8 with sufficient qualifications. Then in cycle II the classical average obtained was 82.25 with an increase of 12.7 and was included in the good category.

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