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# The Influence of Quantum Teaching learning Model on Science Learning Outcomes

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**Abstract:** This study aims to determine the effect of the quantum teaching-learning model on the learning outcomes of science students in Grade V of SDN Balekambang 01 Pagi Jakarta in academic year 2022-2023. Quantum teaching learning Model is a teaching that fosters a pleasant learning atmosphere by promoting curiosity and adding student experience, The types of quantitative research in the form of proper experimental design pretest–posttest control grub design. Samples were taken randomly from number of 32 eksperiment class and 32 students in control class. Based on the result of T-test, it is known that with a significance level of a = 0.05 with sig. (2-tailed) = 0.039 so that H1 is accepted and Ho rejected. It can be concluded that the quantum teaching-learning model significantly influences the learning outcomes of science students in Grade V of SDN Balekambang 01 Pagi.

## INTRODUCTION

Learning is an activity or process to increase knowledge, improve skills, improve behaviour and attitudes and strengthen personality. Learning activities can happen anywhere and anytime. Schools serve as formal institutions where learning takes place. One of the school subjects, especially in elementary school (SD), is Natural Science (IPA). Through learning science, students are expected to develop themselves and the surrounding environment in everyday life. In the learning process, the teacher invites students to take advantage of the surrounding nature as a source of learning.

A common problem elementary school (SD) students face when learning science is difficulty mastering concepts, causing low student learning outcomes. One reason is that students are not allowed to expand their knowledge to become understanding actively. When learning, the students memorise a concept instead of understanding an idea taught, and the teacher is the only source of knowledge (Imanuel, 2015). Selecting a suitable learning model dramatically affects the success of students' learning outcomes in science learning. It takes skill and understanding from a teacher to achieve appropriate learning outcomes. The impact that will be caused if the teacher does not master the material and learning strategies is that students will find it challenging to understand the learning material perfectly.

Science Learning is a science that studies events that occur by observing, experimenting, applying and using theory (Ketut and MD, 2017). So, it can be concluded that learning science develops critical thinking skills.

Based on the observations and interview problems in learning science in Class V SDN Balekambang 01 Pagi Jakarta states low student learning outcomes. It is seen from the average value of the test is still below the Standard Minimum completeness criteria (KKM) is 70. The problem is that the students sit and listen to the material explained by the teacher. This resulted in the emergence of boredom and saturation in students, as well as in the learning process, which has an impact on the decline in student learning outcomes in science learning.

Things to consider so that students are more active in learning science as a teacher should be able to choose a suitable learning model to be more exciting and motivate students to be more involved in the classroom. One of the learning models that can be used to improve student learning outcomes in science learning is through Quantum Teaching learning model. Quantum teaching is a learner model that changes the learning atmosphere to be fun and festive with all the nuances, and quantum teaching is also related to the interaction of learners and maximising learning moments (Sulthon, 2017).

The principles of the quantum learning Learning model are: (a) Everything speaks, that is, everything from the classroom environment to the teacher's body language, the paper distributed to the learning design all sends a message about learning, (b) everything is purposeful, that is, everything that happens in the teaching and learning process has a purpose, (c) experience before naming, that is, the learning process, that is, students deserve recognition for their achievements and confidence, (e) celebrate, that is, as a form of feedback, there needs to be a celebration of progress and increased Association of positive emotions with learning. (Fitri, Adnan and Irdamurni, 2020).

There are steps to applying the quantum teaching-learning model called TANDUR, namely (1) grow, by creating student interest and motivation, (2) natural, inviting students to experience the learning process directly, (3) Name, provide keywords and concepts, (4) demonstrate, allow students to show that they have mastered learning, (5) Repeat, Repeat or present the material points they have learned, (6) celebrate, appreciate student success.

In the Quantum Teaching model, there is an essential term that is at the same time its main principle 'bring their world to our world, and deliver our world to their World'. This central principle explains that the first step in teaching must be taken in trying to enter the world experienced by learners (Cahyaningrum, AD, and Asyhari 2019). It is uniting the teacher's thoughts and feelings with events, thoughts or feelings of learners related to their home, social, artistic, recreational or academic life. When that connection is established, it can bring them into our world and give them an understanding of what it contains (Murnawan, 2021).

The advantages of applying the quantum teaching model are that it can improve learning outcomes and foster student learning Interests by associating subject matter (content) with everyday life (context), besides that this model interacts with all components in the classroom and school environment to be designed in such a way that all topics of conversation and aims for the benefit of students, so that students can develop themselves and their knowledge. (Murnawan, 2021)

This research is supported by several relevant studies, namely, research conducted by Wote, Sasingan, and Kitong (2020), which explains that the quantum teaching model provides teachers with opportunities to innovate in learning. Both studies conducted by Widiyono (2021) demonstrate that applying the quantum teaching-learning model can improve elementary school science learning outcomes

## METHOD

This study was conducted at SDN Balekambang 01 Pagi, located on Jl. I was riding The Alley. Rawa Elok, Balekambang, District. Kramat Jati, East Jakarta. The research was carried out in the even semester of the academic year 2022 – 2023.

This study aims to determine the effect of the Quantum Teaching learning model on learning outcomes in science class V SDN Balekambang 01 Jakarta. This research method is experimental quantitative research in the form of a True Experimental design Pretest-Posttest Control Group Design. In this study design, two groups are randomly selected: the practical class (treated) and the control class (untreated).

The population of this study is all students of Class V of SDN Balekambang 01 Pagi, totalling 64 students divided into two classes, namely the VA class and the VB class. The sample of this study is the fifth-grade students who were taken at random, resulting in 32 experimental class students and 32 control class students. Data collection techniques used are test techniques in the form of pretest and posttest, test techniques using multiple choice questions. Research instruments first performed validation and reliability test before use. The data analysis technique used to test the hypothesis is an Independent Test t-test. Previously used test requirements analysis with normality test and homogeneity test.

## RESULT & DICUSSION

Requirements test data analysis is done by validation test and homogeneity test. Validation of MCQs item using biseral correlation coefficient formula. Test criteria if the value of $r_{hitung} > r_{table}$. Of the 35 questions, there were 28 valid and 7 invalid.

After conducting a validity test, the researchers conducted a reliability test with Formula K-R.20 to measure students' accuracy in answering questions. The instrument is said to be reliable when the $r_{hitung} > r_{table}$.

Based on the data obtained, the value of rhitung = 0.9206 and rtable = 0.361 with significant levels a = 0.05

and n = 30. So it can be concluded that the IPA instrument used in this study is reliable because $r_{hitung} > r_{table}$ ( 0.9206 > 0.361).

The initial data collection is done by giving a pretest before treatment to both experimental and control class samples and obtaining pretest data. Then the experimental class was treated using the quantum teaching-learning model, and the experimental class using the Cermah learning model. After getting the data retrieval treatment in the form of a post-test. Then the pretest and post-test data in the data normality test. A normality test was conducted to determine whether the results of the two samples used in this study were usually distributed.

*Tabel 1 Tests of Normality*

| Class | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | | Statistic | df | Sig. | Statistic | df | Sig. |
| Hasil Belajar IPA | Pretest Eksperimen | .121 | 32 | .200* | .963 | 32 | .329 |
| | Posttest Eksperimen | .155 | 32 | .048 | .948 | 32 | .125 |
| | Pretest control | .118 | 32 | .200* | .963 | 32 | .338 |
| | Posttest control | .110 | 32 | .200* | .950 | 32 | .141 |

To determine the results of the normal distribution of data or not, if sig > 0,05, the result is typical, and if sig < 0,05, then the development is abnormal. The table above shows the significant effects of the normality test of science learning outcomes pretest experimental classic. 0,048, the pretest control class sig. 0,200 and posttest sig, 0,200. It can be concluded that the data group is normally distributed.

After knowing the level of normality of the data, the next homogeneity test is performed to determine the level of similarity between the two groups, namely the experimental group and the control group, to accept or reject the hypothesis by comparing the significant value at the statistical level with 0.05 (significant > 0.05).

*Table 2 Homogeneity Test Results*

| | | Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|---|
| learning outcomes | Based on Mean | 8.358 | 1 | 62 | .005 |
| | Based on Median | 8.040 | 1 | 62 | .006 |
| | Based on the Median and with adjusted df | 8.040 | 1 | 46.661 | .007 |
| | Based on trimmed mean | 8.356 | 1 | 62 | .005 |

The results of the homogeneity test of research variables are known based on the trimmed mean of learning outcomes worth 0.05. Based on these results, the experimental and control class learning outcomes are homogeneous because they are not < 0.05.

Hypothesis test data posttest science learning outcomes experimental and control class students, the analysis used is an independent Test t-test using the help of SPSS version 29.

*Table 3 Independent T-test Results*

| learning outcomes | t-test for Equality of Means |
|---|---|
| | Sig. (2-tailed) |
| Equal variances assumed | 0,039 |
| Equal variances not assumed | 0,034 |

Based on the table above-obtained sig value (2-tailed) of 0.039 < 0.05, it can be concluded that there is a difference in the average learning outcomes of experimental and control classes. More details about the average post-test experiments and control classes can be seen below.

*Table 4 Results Of Posttest Average Value*

| | Class | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Learning outcomes | Eksperimen (Quantum Teaching) | 32 | 78 | 10.185 | 1.800 |
| | Kontrol (Konvensional) | 32 | 60 | 17.028 | 3.010 |

Based on the results of the calculation of the Independent sample t–test, it is known that the average learning outcomes of the experimental class are 78.00. The average learning outcomes of the control class are 60.00, so it can be concluded that the intermediate learning outcomes of the experimental group increased by 18.00 is greater than the control class. From the table, it is known that the count is 4,856, with a significance of 0.039. The significance value is less than 0.05 ( 0.039 > 0.05 ). It can be concluded that there is a significant difference in student learning outcomes scores in the experimental class and control class.

**Results**

The average value of pretest and post-test student learning outcomes in experimental and control classes are presented in the following table:

*Table 5 The Average Score Of Pretest And Posttest Experimental Class And Control Class.*

| Class | Mean Pretest | Mean Posttest | improvements |
|---|---|---|---|
| Eksperimen | 42,41 | 76,78 | 34,37 |
| Control | 41.07 | 59,15 | 18,08 |

Based on the table obtained, the average score on the pretest experimental class student learning outcomes worth 42.42, and post-test, 76.78, with an increase of 34.37. At the same time, the average score of the pretest control class student learning outcomes was 42.41 and 59.15 posttest, with a rise of 18.08.

Data analysis of experimental and control class learning outcomes to test hypotheses. Using the t-test shows the value of GIS. (2-tailed) greater than 0.05. Of 0.039 > 0.05, the results showed that Ho was rejected and H1 was accepted, meaning that using the Quantum Teaching learning model affects the learning outcomes of science students in Grade V of SDN Balekambang 01 Pagi Jakarta. This is evidenced by the use of the Quantum Teaching learning model is more effective, with an average value of 78 on the results of learning science class V compared to those who do not use the Quantum Teaching learning model has an average value of 60.

## CONCLUSION

Based on the above analysis, it has been proven that there are significant differences between the learning model of Quantum Teaching and conventional methods in improving student learning outcomes in learning science class V SDN Balekambang 01 Pagi East Jakarta. This causes the Quantum Teaching learning model to have a higher average and improvement compared to conventional methods because the Quantum Teaching model changes the learning atmosphere to be more lively by inviting students to experience learning directly. While the traditional way of students only fixated on the explanation of the teacher, and students are not active in learning (Masang, 2021)

Science Learning by using Quantum Teaching can make students more active and involve students directly in the learning experience so that the learning process becomes fun for students in understanding the learning materials taught, thereby improving students ' science learning outcomes. Therefore, the Quantum Teaching learning model needs to be used by teachers in learning.

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