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THE EFFECT OF QUANTUM TEACHING MODEL IN SCIENCE LEARNING ON STUDENT'S LEARNING MOTIVATION OF 4TH GRADE STUDENT

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ABSTRACT
This research was conducted on the basis of the discovery of problems found at SDN Borong, namely the low motivation for student learning. The purpose of this study is to determine the description of the application of the quantum teaching model in science learning, (2) to find out the picture of student learning motivation, and (3) to determine the influence of the application of the quantum teaching model on science learning on the learning motivation of grade IV UPT SPF students at SDN Borong. This research uses a quantitative approach with a type of experimental research in the form of quasi-experimental design type non-equivalent control group design. The study population is all grade IV. The samples in the study were class IV students who were selected by purposive sampling technique. Research data were collected using observations, questionnaires, and documentation provided before and after the implementation of learning. The data were analyzed using descriptive and inferential analysis. The results of the descriptive analysis showed that the first treatment went well and the second treatment went very well . The results of inferential analysis using independent sample t-test showed the difference in post non-test results between the experimental class and the control class. This shows that there is an increase in student learning motivation in the experimental group higher than the control class. So that it can be concluded that: (1) the learning process with the application of the quantum teaching model is effective, (2) the results of the student questionnaire show an increase in student learning motivation in science learning, (3) there is a significant influence on the application of the quantum teaching model on student learning motivation in science learning grade IV UPT SPF SDN Borong Kota Makassar.

INTRODUCTION

Learning natural sciences in elementary schools is inseparable from various problems, where many students perceive science as a subject that is boring and quite complicated. At this time less students pay attention to science lessons. One of the things that causes students to dislike science is because the science lessons taught are not meaningful for students, where many students have not been able to find common threads between science subjects and their uses in students' real lives. Many teachers find the problem of low student motivation in learning, especially in science lessons, where students think science is a pretty boring lesson. In fact, it has been regulated in Permendikbud No. 22 of 2016 regarding basic education process standards which are used as a reference for achieving graduate competence. This is also in line with (Dewi & Hidayanti, 2022) statement that "Success in learning is greatly influenced by several aspects. These aspects can be grouped into 2 groups, namely aspects within the student (internal) and aspects from outside the student (external). Aspects that influence student success in learning include students' abilities, talents, effort, motivation, desire, fatigue, health, and habits. The spirit of learning is an important thing that should be considered in teaching and learning activities.

It is this enthusiasm for learning that must be raised early in students. Motivation can be said to be the totality of students' internal power that gives rise to learning activities, which can guarantee the continuity of learning activities and which gives direction to learning activities, so that the mission desired by the subject of learning can be achieved. In this case the selection of the right model affects the success of the teaching and learning process in

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the classroom. Science learning really needs skills from a teacher so that students can easily understand the material provided by the teacher, because it is difficult to make teaching that can be accepted by all students. Makes everything impactful and meaningful on student's progress in classroom is something that teacher missing about. Being able to transform everything in classroom into sourced of learning is hard to do without a way and don't forget about reward and affirmation for the students.

Based on the results of initial observations made on March 10, 2022, information was obtained from the field that during the learning process the students paid little attention to the lessons explained by the teacher, there were still things that disturbed the theme and students were less enthusiastic and enthusiastic in doing the assignments given by the teacher. This indicates the low motivation of students in science lessons. Seeing the existing problems, one appropriate learning model is the quantum teaching model.

Applying the quantum teaching learning model in class, a teacher can create a pleasant learning atmosphere so that it affects students' learning motivation. According to (Sobandi & Yuniarti, 2016) said that the quantum teaching model is a form of innovation in creating various interactions, this includes everything that is in and around the learning moment. An alternative teaching technique that teachers can do to anticipate this is to use the quantum teaching learning model, considering that science lessons will be easier and more fun if they are taught clearly. quantum teaching is teaching that can change a pleasant learning atmosphere and change students' natural abilities and talents to become a light that is beneficial for themselves and for others or as known as TANDUR way of learning (DePorter & Hernacki, 2012).

Relevant research shows that the quantum teaching learning model has a significant influence in the form of a positive influence on student motivation and learning outcomes. This research was conducted by Sitti Hijrah (2020) in Makassar with the research object being class IV in science lessons. This research shows that the average score of students' science learning changed and was significantly affected after the use of the quantum teaching model. This means that there is a significant change and effect of the quantum teaching model on student's learning motivation to learn science. Based on the description of the problems and solutions that have been stated above, the researcher intends to conduct research with the title: "The Effect of Quantum Teaching Learning Model in Science Learning on Student Motivation in Grade IV UPT SPF SDN Borong Makassar City"

METHOD

The type of research used in this research is experimental research with a quantitative approach. The research design used in this study is a Quasi-Experimental research design. This research uses a nonequivalent control group design type. The research design can be described as follows:

Table 1. Research Design Draft

Pre-test	Treatment	Post-test
O_1	E	O_2
O_3	K	O_4

Source: (Sugiyono, 2017)

Description:
O_1 : Pre non-test experimental class
O_2 : Post non-test experimental class
O_3 : Pre non-test control class
O_4 : Post non-test control class
E : Treatment of the application of the Quantum Teaching model
K : Treatment without applying the Quantum Teaching model

Population are students from 4^{th} grade and sampling is 4^{th} A as an experiment and 4^{th} B as a control. The sampling technique carried out by the researcher is using a non-probability sampling technique, namely a sampling technique that does not provide equal opportunities/opportunities for each element or member. The data collection technique in this research is the observation technique with the observation sheet as an instrument to measure the description

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of the application of the quantum teaching model and the test technique with the test sheet as an instrument to measure the students' higher order thinking skills. Before the instrument is used, it must be validated by experts in the field.

The data analysis technique in this study is in the form of descriptive analysis, which serves to describe or provide an overview of the object under study through sample or population data as it is without analyzing and making applicable conclusions. the prerequisite analysis test is normality and homogeneity test and the final analysis (hypothesis testing) is the analysis of the Independent Sample t-test. Independent Sample t-test. The test criteria if the probability value is greater than the significance level of 0.05 then Ho is accepted and Ha is rejected.

RESULTS AND DISCUSSION

The Description of the Application of the Quantum Teaching Model in Learning Proccess

The learning process in the experimental group was carried out in two meetings with a total of one month of research time used by the researcher. The results of observing the implementation of the quantum teaching model in learning science class IV in more detail is described as follows:

Table 2. Observation result of the Application of the Quantum Teaching Model

Keterangan	***Treatment* 1**	***Treatment* 2**
Earning score/ Max. score	32/45	44/45
Percentage	71%	98%
Category	Well	Very well

Source: Observation sheet's result

Based on the table, treatment at meetings 1 and 2 showed that the implementation of the quantum teaching model in the learning process is going very well. This can be seen in the percentage of implementation categories of the quantum teaching model which experienced significant changes after implementing it.It grows the number from 71 to 98 of percentage.

The Description of Student's Learning Motivation

The experimental group applied the quantum teaching model in the learning process while the control group acted as a comparison group because in the learning process the control group was not given treatment in the form of applying the quantum teaching model. The description of the pre-non-test results of the experimental group students can be seen in the following table:

Table 3. Description of Student's motivation Pre-non-test Results

Descriptive statistics	**Statistical Value**	
	Experiment	**Control**
Number of Samples	32	29
Lowest Value	30	36
The highest score	51	80
Mean	41,22	48,69
Range	21	44
Standard Deviation	7,294	9,795
Median	43	47
Modus	30	41

Based on table above, there was a change in the average value between the experimental group and the control group but this did not show a significant difference to the initial condition of the level of learning motivation between the experimental group and the control group. It can be observed that the average value (mean) of the experimental group is 41.22 while the average value (mean) of the control group is 48.69. In addition, the experimental group's

pre-non-test value data were smaller than the control group. This can be seen in the value range (range) between the two groups. Based on the standard deviation value, it shows that the level of distribution of the experimental group data is lower, namely 7.294 compared to the control group data, which is 9.795.

Table 4. Description of Student's motivation Post non-test Results

Descriptive statistics	Statistical Value	
	Experiment	Control
Number of Samples	32	29
Lowest Value	30	36
The highest score	92	81
Mean	69,31	60,66
Range	40	45
Standard Deviation	10,603	10,916
Median	68	60
Modus	80	66

In accordance with table 4. showed that there was a significant difference in student learning motivation between the experimental group and the control group. It can be observed in the average value (mean) of the experimental group of 69.31 while the average value (mean) of the control group is 60.66. In addition, the experimental group's post non-test value data was higher than the control group. This can be observed in the value range (range) between the two groups. Based on the standard deviation value, it shows that the level of distribution of the control group data is higher, namely 10.916 compared to the experimental group data, which is 10.603.

In the experimental group it was more dominated by students who had high learning motivation with a percentage of 50%, while in the control group it was dominated by students' learning motivation in the medium category with a percentage of 52%. When compared, the low categorization of student learning motivation still belongs to the control group with an acquisition percentage of 7%, while the experimental group does not have this categorization. The highest category level is the high and very high categories held by the experimental class group.

The Effect of Applying the Quantum Teaching Model on Student Learning Motivation in Science

The normality test aims to determine whether the data distribution is normal or not. The normality test was carried out using the Kolmogrov-Smirnow and processed with the help of the IBM SPSS Statistics Version 26.0 program. Furthermore, it can be said that the data is normally distributed if the probability value is in the Kolmogrov-Smirnov test is greater than the specified α value, which is 5% (0.05). The following data on the normality test results for the pre-non-test and post-non-test for the experimental and control classes can be seen in the table below:

Table 5. Normality test

Data	Probability Value	Description
Pretest Experimental Group	0,064	0,064 > 0,05 = normal
Pretest Control Group	0,180	0,180 > 0,05 = normal
Posttest Experimental Group	0,200	0,200 > 0,05 = normal
Posttest Control Group	0,200	0,200 > 0,05 = normal

The results of the normality test for the pre-non-test and post-non-test data for the experimental class and the control class are normally distributed data. This can be proven from the results of the data normality test, the probability value is greater than 0.05. So it can be concluded that the pre non test data and post non test data obtained are normally distributed.

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Table 6. Homogeneity Test

Data	Probabilities' Value	Description
Pretest Experiment and Control Group	0,481	0,481 > 0,05 = Homogeneous
Posttest Experiment and Control Group	0,939	0,939 > 0,05 = Homogeneous

Both pairs of pre non test and post non test data groups can be stated that there is no significant difference in variance between the two data groups or the data in this study is homogeneous. This is evidenced in the table above which shows that the probability value obtained is greater than 0.05. Thus, a hypothesis test can be carried out using an independent sample t-test.

This analysis aims to determine differences in student motivation after being given treatment in the form of applying the quantum teaching model to the experimental class and other learning models to the control class. The hypothesis testing in this study was carried out with the help of the Statistical Package for Social Science (SPSS) version 26.0. The results of the Independent sample t-test for the pre-non-test values for the experimental class and the control class are as follows:

Table 7. Test Results Pretest Independent Sample t-Test

Data	t	df	*Sig* (2tailed)	Description
Pretest experimental group and pretest control group	-2,194	59	0,32	0,32 > 0,05 = No difference

The criterion for testing the hypothesis is that Ho is accepted if the significance value is > 0.05 and Ho is rejected if the significance is <0.05. Based on the table above, it can be seen that the significance value (0.32 > 0.05) means that Ho is accepted, meaning that there is no difference in the average pre-non-test scores for the experimental group and the pre-non-test for the control group. Then, if the calculated t value is -2.194 compared to the t table value with a value of α = 5% and df = 59 then the t table value is 1.673. Because t count is lower than t table (-2.194 <1.671), it can be concluded that there is no significant difference.

Data	t	df	*Sig* (2-tailed)	Description
Experimental group posttest and control group posttest	3,140	59	0,03	0,03 < 0,05 = There is a difference

The criterion for testing the hypothesis is that H_0 is accepted if the significance value is > 0.05 and H_0 is rejected if the significance value is <0.05. Based on the table above, it can be seen that the significance value (0.03 <0.05) means H_0 is rejected and Ha is accepted, meaning that there is a difference in the average post non-test scores of the experimental group and the post non-test of the control group. The calculated t value from the test results above is 3.140. The value of t table with a significance level = 0.05 and the value of df = 59 then the value of t table is 1.671. Because t count is greater than t table (3.140> 1.671) it can be concluded that there is a significant difference between students' learning motivation in the experimental group before and after giving (treatment) in the form of applying the quantum teaching model.

The research was conducted at UPT SPF SDN Borong Makassar City for approximately 1 week. The research subjects used were class IV A as an experimental class of 32 students and class IV B as a control class with a total of 29 students.

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Grow. In this indicator, the teacher has carried out his part well, although there are still aspects that are not carried out optimally, such as building class atmosphere and conveying learning motivation. Next is Natural, the aspect that has not been implemented is the search for a variety of information by students to find their own version of the answer in the indicators expressing both opinions and questions that are still lacking due to the adaptation and awareness shown by students at the beginning of the meeting is also a reason for the lack of optimal application of the quantum teaching model. The indicators on the Demonstration aspect went quite well, where students understood how to work in groups and solve problems in the experiment to be discussed together. Repeat, not implemented properly because of limited time and lack of student confidence.

The major aspect that forms the basis is time. In accordance with the principle of the quantum teaching model which requires quite a long duration in order to achieve its goals properly and precisely, the time obtained during learning is not much due to the limited face-to-face learning process.

The application of the quantum teaching model at the second meeting went very well. At the second meeting, students showed a sense of security and comfort to dare to express both opinions and questions. This was very helpful in the initial process, namely Grow. Students quite a lot establish two-way communication between friends and also the teacher, seen from the discussion activities where students often ask about the experimental steps that are being carried out on the Repeat indicator. In the Naming aspect, students come to understand that linking their life and the learning process can be better understood when they know better how to map information. The end of the lesson was closed with appreciation by giving each student their achievements.

The teacher is also more flexible in giving meaning to learning by using the facilities and what is in the classroom to become a learning resource, one way to overcome the time solution and limited book resources. This is in line with the principle of quantum teaching itself, namely "What does this learning mean for me?"

In general, the learning implementation scores obtained during the two meetings were in a good category and based on the data, the learning process was categorized as very good. Starting from almost all aspects of the class participating in "talking" which also means that researchers are able to become teachers who animate the class and use alternatives in the classroom for learning. Followed by a learning process that has clear meaning and goals to be achieved, followed by stimulation to students in the form of daily activities in which they act as subjects and are rewarded with positive responses. Approaching the end of the learning process, students get recognition for the process and get rewards for the results. With the conclusion, learning becomes a complete space for students to feel comfortable and open to learning as well as finding out.

The description of students' learning motivation in science learning was then tested again by collecting data from the post non-test questionnaire and analyzed again. The level of learning motivation shows a significant change.

The description of students' learning motivation based on the research results can be concluded that there are differences in learning motivation between classes that are given treatment and without using the quantum teaching model. Students' learning motivation in the experimental class showed lively learning and a desire to be more in the aspects of assessment and learning outcomes, knowing and being aware of the need to learn, conveying ideas boldly as well as a sense of comfort shown by gestures and verbal responses. Whereas in the control class, there was still a change but it was not significant.

Learning to apply the quantum teaching model can be said to be a learning model that emphasizes providing meaningful benefits and also emphasizes the level of enjoyment of students or students. Not only that, in line with the opinion of Bobbi de Porter (2010) saying that quantum teaching exists to encourage students to interpret, experience, and demonstrate direct learning, as well as make learning a fun and useful process and the highest appreciation of student achievement. Why is that, because quantum teaching is designed to build students' desire to learn in a fun and meaningful way.

Changes can be seen in the second meeting and the results of the post non-test descriptive analysis which show changes in the accumulated score of the observation sheet assessment and the average score obtained by students. Not only that, the learning conditions have changed from the first meeting. Changes both in the way of educating and students. Teachers have started to be able to motivate students totally. They enjoy the atmosphere created. Then in the third meeting there was no more rigidity for both teachers and students. It has been seen that many students put out their creative ideas and or just expressed opinions.

TANDUR, appears to be an appropriate and appropriate rhythm to be applied with the implementation of a meaningful and enjoyable learning process. Where the teacher is not only silent but tries to bring students to know and experience the material of style and motion. How can motion exist and how force affects it with simple language

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and learning resources from all the components in the class that can be utilized. So it can be concluded that there are visible and measurable differences. This means that there is an effect of using the quantum teaching model in science learning on the learning motivation of fourth grade UPT SPF SDN Borong students Makassar city.

CONCLUSION

Based on the results of the research that has been done, it can be concluded several things, including The application of the quantum teaching model in the experimental group learning process in science learning for class IV UPT SPF SDN Borong Makassar City is very good. Student motivation shows a change after the application of the quantum teaching model in terms of learning. This is evidenced by the measured results of the comparison of the average pre-non-test and post-non-test values between the experimental class and the control class. There is a significant influence by the application of the quantum teaching model to science learning on the learning motivation of fourth grade UPT SPF SDN students Makassar City Wholesale.

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