SENTRI: Jurnal Riset Ilmiah

Vol.1, No.4 Desember 2022

ejournal.nusantaraglobal.ac.id/index.php/sentri

QUANTUM LEARNING MODEL TO INCREASE SCIENCE LEARNING ACTIVITIES

Devi Afidin[1],Fauzi Achmad[2],Kasturi[3],Shirly Rizki Kusumaningrum[4],Radeni Sukma Indra Dewi[5]

[1]UPT SDN Kepanjenlor 2, UPT SDN Bumirejo 1, UPT SDN Birowo 3
[2]UPT SDN Kepanjenlor 2, UPT SDN Bumirejo 1, UPT SDN Birowo 3
[3]UPT SDN Kepanjenlor 2, UPT SDN Bumirejo 1, UPT SDN Birowo 3
[4,5]Sekolah Pascasarjana, Pendidikan Dasar, Universitas Negeri Malang, Malang, 65145
E-mail: devi.afidin.2221038@students.um.ac.id[1], fauzi.achmad.2221038@students.um.ac.id[2], kasturi.2221038@students.um.ac.id[3], shirly.rizki.pasca@um.ac.id[4], radenisukmaindradewi.pasca@um.ac.id[5]

Article History:
Received:02-10-2022
Revised: 18-10-2022
Accepted: 04-11-2022

Keywords:
Learning Activities, Natural Sciences, Quantum Learning Model

Abstract: *Based on the observation of student activity in grade 6 of elementary school as a whole during the process of learning science activities, there was a problem that science learning activities were still low. This is evidenced by observational data which shows that science learning activities only reach 40%. The low science learning activity is caused by several factors, including; (1) learning is still centered on the teacher (teacher center), (2) the model used by the teacher is the lecture model. The appropriate solution to this problem is to apply the Quantum Learning model . The teacher has applied the Quantum Learning model in science learning for 3 years. As long as using the Quantum Learning model in science learning, science learning activities are consistently obtained.*

INTRODUCTION

Science learning should be carried out using scientific inquiry (scientific inquiry) to foster the ability to think, work, and behave scientifically and communicate them as an important aspect of life skills. Therefore, learning science in elementary schools emphasizes providing direct learning experiences through the use and development of process skills and scientific attitudes. Based on this, it appears that critical thinking skills are one of the life skills that can be developed through science learning.

Based on observations, teachers in grade 6 of elementary school still apply teacher-centered learning management, not student-centered. So that student activity in science learning is still low. In addition, learning also does not prioritize the right of students to study independently. Based on the overall observation of student activities in the process of science learning activities, the problem is that science learning activities are still low. This is evidenced by observational data which shows that science learning activities only reach 40%. This data was obtained from the results of observations during learning.

The low science learning activity is caused by several factors, including; (1) learning is still centered on the teacher (teacher center), (2) the model used by the teacher is the lecture model. Facing this reality, teachers have a strategic role to create student-centered learning. Through student-centered learning, it is hoped that science learning activities can increase. This role can be carried out by carrying out meaningful learning for students.

The meaning of learning can be generated if by learning students gain meaningful experiences and in accordance with the needs of the surrounding community, and can apply these experiences in their daily lives. The solution that fits the problem above is to apply the Quantum Learning model. De Porter, Bobbi (2007: 9) states that *Quantum Learning* is a lively learning composition, with all its nuances. *Quantum Learning* also includes all the connections, interactions and differences that maximize learning moments.

Quantum Learning focuses on the dynamic relationships in the classroom-interaction environment that establish the foundation and framework for learning. *Quantum Learning* includes specific instructions for creating an effective learning environment to design curriculum, deliver content and facilitate the learning process. The quantum learning framework is as follows: **Cultivate** : Cultivate interest in satisfying "What's in it for me", and make the most of student life. By creating links and shared ownership or mutual understanding, also including/taking advantage of their experiences.

Natural : Give them a learning experience, cultivate a "need to know". **Name :** Naming satisfies the brain's natural desire to identify, sequence, and define. **Demonstrate** : Give students opportunities to translate and apply their knowledge to other learning, and to their lives. The next stage is **Repeat** : Repetition strengthens nerves and fosters a sense of "I know that I know this!". So repetition must be done in multimodality and multi-intelligence, preferably in a different context from the origin (games, performances, dramas and so on). **Celebrate** : Celebrations give a sense of satisfaction by honoring effort, perseverance, and success. If it is worth learning, then it is also worth celebrating. For this lesson, what is an appropriate way to celebrate must be determined. The way to be able to recognize the achievements of each student must also be determined.

RESEARCH METHODS

The problem-solving method used to improve science learning activities in grade 6 at elementary school is using the Quantum Learning learning model. The steps of learning Quantum Learning consist of instill, experience, name, demonstrate, repeat and celebrate. The obstacles experienced by teachers when carrying out learning with the *Quantum Learning model* include: (1) teachers need careful preparation and a supportive environment, (2) the necessary facilities must be available, (3) students are difficult to control when learning. To overcome these obstacles, the teacher coordinates with the Principal and class associations to fulfill the necessary facilities during the implementation of learning with the *Quantum Learning model* . These facilities, for example, accommodation and transportation when learning is carried out outside the classroom.

Obstacles in the form of learning preparation, are overcome by making learning plans that are in accordance with the syntax of the *Quantum Learning model* . In addition, the teacher also prepares teaching aids and learning media according to the material being taught. For obstacles in the form of difficulty controlling students in learning, the teacher uses a group division strategy according to the level of students' academic abilities. So, in

one group consists of students with high, medium and low academic abilities. This is effectively implemented, because there are no students who feel that their group consists of students with low academic abilities. So that students are more easily controlled in the implementation of learning.

RESULT DISCUSSION

1. Science Learning Activities Before the Implementation of the *Quantum Learning Model.*

At the beginning of the learning activity, the teacher greets, invites students to pray and does attendance. Next, the teacher gives apperception by asking questions related to the material. Next, the teacher explains the material to students by lecturing to students. Students seem less enthusiastic in participating in learning, they just sit and listen to the teacher's explanation. After observing it appears that not all students express opinions **,** there are only 2 students who gave their opinion. It can be seen that most students still do not dare to express their opinions and provide responses. Based on this fact, it can be concluded that student learning activity is still low . The teacher also has not been able to motivate students to dare to express their opinions.

Students do not experiment with their friends in one group. They were immediately given practice questions to work on after being given an explanation by the teacher. Based on the observations, it appears that not all students can do the practice questions and do not dare to ask the teacher if they have difficulty. There are students who just stay silent, there are also those who play alone, and some even want to win on their own. The teacher also did not seem to reprimand the students. So that learning activities run less effectively.

Students do not appear to be actively discussing, they tend to work individually. Teachers also do not go around to guide and give attention to students. If there are students who find it difficult the teacher does not know. The interaction of teachers and students is not going well. The teacher also does not give a warning to students who play alone and are not active in learning activities. In addition, students are appointed by the teacher to present answers to practice questions in front of the class in turn.

Some students in the group pointed at each other to come to the front of the class. They did not seem to dare to come to the front of the class, so there was a commotion. The teacher appoints one student from each group to come to the front of the class. This proves that most students still do not have the courage to appear in front of the class. The results of observations made in the learning process show that teaching and learning activities have not run optimally. Observers observe learning activities from beginning to end on teacher and student activities. The data obtained include; (1) teacher teaching activities, (2) science learning activities. The following is a recapitulation of observational data on learning activities.

Based on the observations, the results obtained about the teacher's teaching activities during the learning process. The teacher's teaching activities are focused on the implementation of learning materials for Alternative Electrical Energy Sources. The data on the recapitulation of teacher teaching activities can be seen in the following table:

Table 1.1. Teacher Teaching Activity Observation Format

No	Observed aspects	Score	
		0	1
1.	The teacher conveys the basic competencies, learning objectives, and learning activities that will be carried out by students.		1

No	Observed aspects	Score	
		0	**1**
2.	The teacher explains the steps of the learning activities.	0	
3.	The teacher forms a group		1
4.	The teacher guides students in group activities.	0	
5.	The teacher implements the learning syntax in a coherent and correct manner.	0	
6.	Teacher gives Student Worksheet	0	
7.	The teacher gives final test questions and provides guidance if needed.		1
8.	The teacher gives students the opportunity to ask questions.		1
9.	The teacher guides the students to make conclusions.	0	
10.	The teacher assesses student learning outcomes.		1
Total score			5
Percentage Average Score			50%
Success Criteria			Not enough

Based on table 1.1. It can be seen that the teacher's activities in science learning materials for Alternative Electrical Energy Sources, the implementation of aspects of teacher activity reaches a score of 5 with the percentage of the average value of teacher activities as much as 50% and the criteria for success are less. This shows that teaching activities by teachers have not been maximized. Aspects of teacher activities that have not been implemented, namely: (1) explaining the steps of learning activities, (2) guiding students in groups, (3) implementing learning syntax in a coherent and correct manner, (4) providing Student Worksheets, (5) draw conclusions with students.

Data on science learning activities were obtained from observations of student behavior during learning and based on field notes. The recapitulation of science learning activities during the study of Alternative Electrical Energy Sources can be seen in the following table:

Table 1.2 Format of Observation of Science Learning Activities

No	Observed aspects	Score	
		0	**1**
1.	Students listen to the teacher's explanation of basic competencies, learning objectives, and learning activities to be carried out *(Listening activities).*		1
2.	Students pay attention to the explanation of the steps of learning activities *(Visual activities).*	0	
3.	Students form groups *(motor activities).*		1
4.	Students actively cooperate in group activities *(Oral activities).*	0	
5.	Students carry out learning steps coherently and correctly *(motor activities).*	0	

No	Observed aspects	Score	
		0	**1**
6.	Students work on Student Worksheets *(Drawing activities).*	0	
7.	Students work on the final test questions *(writing activities).*		1
8.	Students ask questions about the material *(Oral Activities).*		1
9.	Students play an active role in making conclusions *(Mental Activities).*	0	
10.	Students convey impressions and messages *(Emotional Activities).*	0	
Total score			4
Percentage Average Score			40%
Success Criteria			Not enough

Based on table 1.2. it can be obtained data that student activity in science learning material for Alternative Electrical Energy Sources gets a score of 4, the percentage value is 40%, and the criteria for success are less. In implementing learning there are six aspects that have not been implemented by students, namely: (1) students do not get an explanation of the steps of learning activities , (2) students are busy alone and do not actively cooperate in group work, (3) students do not carry out the steps. the learning steps are coherent and correct, (4) students do not work on Student Worksheets, (5) students are not able to make conclusions about Alternative Electrical Energy Sources, (6) students are not given the opportunity to convey impressions and messages after learning is complete.

2. **Science Learning Activities After the Implementation of the *Quantum Learning Model.***

In teaching and learning activities, teachers carry out learning with the *Quantum learning model.* Learning activities begin with ***growth activities*** . In this activity the teacher discusses with students about the benefits of style material for students' lives. Students are given the opportunity to express their opinions in turn. To motivate students to express their opinions, the teacher provides additional value for students who dare to express their opinions.

The motivation of the teacher affects the students' courage to express their opinion. In this activity, many students dared to express their opinion. There were 12 children who dared to express their opinion about what benefits they would have if they learned the shape, nature and force of magnets. So it can be concluded that students are getting used to the *Quantum learning model* . The next activity is activity ***natural*** . In this activity students are given the opportunity to conduct experiments on the shape, nature and force of magnets. All students in the group were actively involved in the experiment. The teacher designs an experiment that requires good group cooperation and all group members are involved.

In this ***natural activity*** , students seemed enthusiastic about carrying out experiments on the shape, nature and force of magnets. The experiments they carried out included bringing the magnet closer to objects in the surrounding environment, bringing the magnetic poles of the namesake and not the same, as well as other experiments. Each group

member gets a role in the experiment. So that there are no more passive and self-winning children in their group.

The next activity is the ***name activity*** . In this activity, students are guided by students in their groups to look for keywords and concepts about shapes, properties and magnetic forces. Students work on the worksheets in the student book. Students discuss in groups to complete the worksheet. When students discuss actively, the teacher goes around and pays attention to each group. If there are students who find it difficult the teacher can give instructions. The interaction of teachers and students went very well. The teacher also gave a warning to students who played alone and were not active in group discussions. So that the group discussion runs effectively.

The next activity is ***demonstrate*** . In this activity students are given the opportunity to relate personal experiences with new data so that students live and make it a personal experience. In addition, students are also given the opportunity to present the results of group work in front of the class in turn. In ***demonstration activities*** , the students' courage to appear in front of the class was very good. They are confident and able to convey the results of their group work well. The other students were also brave and able to respond to the work of their friends from other groups. Teachers are also more active in providing reinforcement and feedback to students. So that demonstration activities run effectively.

The next activity is a ***repeat activity*** . In this activity, students are guided by the teacher to repeat the material about the shape, nature and magnetic force . Students are also given the opportunity to confirm that they really know. This is done by imitating famous people such as teachers, experts, or figures. They were given the opportunity to teach the material to their groups. The teacher also goes around each group to provide reinforcement and feedback to students.

In addition to being given the opportunity to explain the material that has been studied to a group of friends, students also make conclusions under the guidance of the teacher. The conclusions made by students are written on the blackboard. The teacher provides corrections if the conclusions made by students are still not right. Other students are also given the opportunity to ask if there is part of the material that has not been understood. So that this ***repetition activity*** is very useful for students to confirm that they have indeed understood the material that has been studied.

The last activity in implementing *Quantum learning* is ***celebrating*** . In this activity the teacher carries out a celebration to connect learning with positive associations (recognition for completion, participation, acquisition of skills, and knowledge) in the form of praise and appreciation for the best students. This activity has a positive impact on students. They seemed enthusiastic and happy with the learning carried out by the teacher. So that the learning series with the *Quantum learning model* carried out by the teacher provides a meaningful experience to students.

Observation activities are carried out by observers and also teachers when learning takes place. Observers observe learning activities from beginning to end on teacher and student activities. The data obtained include; (1) teacher activities, (2) student learning activities. The following is a recapitulation of observational data during the learning process.

The results of observations made on learning activities obtained results about teacher activities during the learning process. The teacher's activities are focused on implementing the *Quantum Learning model* in science learning the material of shape, nature and magnetic force . Data recapitulation of teacher activities in implementing the *Quantum Learning model* can be seen in the following table.

Table 1.3 Teacher Teaching Activity Observation Format

No	Observed aspects	Score	
		0	**1**
1.	The teacher conveys the basic competencies, learning objectives, and learning activities that will be carried out by students.		1
2.	The teacher explains the steps of learning activities with the *Quantum Learning model.*		1
3.	The teacher forms a group	0	
4.	The teacher guides students in group activities.		1
5.	The teacher implements the learning syntax with the *Quantum Learning model in a* coherent and correct manner.		1
6.	Teacher gives Student Worksheet		1
7.	The teacher gives final test questions and provides guidance if needed.		1
8.	The teacher gives students the opportunity to ask questions.		1
9.	The teacher guides the students to make conclusions.		1
10.	The teacher assesses student learning outcomes.		1
Total score			9
Percentage Average Score			90%
Success Criteria			Very good

Based on table 1.3, it can be seen that the teacher's activities in learning the shape, nature and magnetic force , the implementation of aspects of the *Quantum Learning model* reached a score of 9 with the percentage of the average value of teacher activities as much as 90% and the criteria for success were very good. Based on the results of the field notes, the teacher was very good at guiding students to be careful in conducting observations and experiments. Aspects of *Quantum Learning* that have not been seen, namely: forming new groups so that students don't get bored.

Data on science learning activities were obtained from observations of student behavior during learning and based on field notes. The recapitulation of science learning activities while participating in learning activities with the *Quantum Learning model* can be seen in the following table.

Table 1.4 Format of Observation of Science Learning Activities

No	Observed aspects	Score	
		0	**1**
1.	Students listen to the teacher's explanation of basic competencies, learning objectives, and learning activities to be carried out *(Listening activities).*		1
2.	Students pay attention to the explanation of the steps of learning activities *(Visual activities).*		1

No	Observed aspects	Score	
		0	1
3.	Students form groups *(motor activities).*	0	
4.	Students actively cooperate in group activities *(Oral activities).*		1
5.	Students carry out learning steps coherently and correctly *(motor activities).*		1
6.	Students work on Student Worksheets *(Drawing activities).*		1
7.	Students work on the final test questions *(writing activities).*		1
8.	Students ask questions about the material *(Oral Activities).*		1
9.	Students play an active role in making conclusions *(Mental Activities).*		1
10.	Students convey impressions and messages *(Emotional Activities).*		1
Total score			9
Percentage Average Score			90%
Success Criteria			Very good

Based on table 1.4, it can be obtained data that student activity scores 9, the percentage value is 90%, and the success criteria are very good. In implementing the *Quantum learning model* , there is one aspect that has not been implemented by students, namely: students do not form new groups, so some students want to form new groups when participating in learning.

Students are active and enthusiastic when conducting observations and experiments. At the time of discussion, students seemed enthusiastic and active in discussing and were not in a hurry to draw conclusions, so that when students communicated their work they obtained maximum results. The courage of students to express their opinions and students' self-confidence is also good. Seen when they dare to appear in front of the class with confidence.

Things that have improved in the learning activities carried out by teachers include; (1) teachers have implemented learning with the *Quantum Learning model* very well and in accordance with the lesson plans made, (2) teacher teaching activities and student learning activities in science learning have increased significantly. The recapitulation of teacher activities and student learning activities can be presented in the following table:

Table 1.5 Recapitulation of Teacher Teaching Activities

No	Activity	Success Percentage	Success Criteria
1.	Teacher Teaching Activities Before the *Quantum Learning Model is* implemented.	50%	Not enough

2.	Teacher Teaching Activities After the *Quantum Learning Model is* implemented.	90%	Very good

In student activity, it was found that the activeness of students in participating in learning had increased very significantly. The visible student activities are; (1) students have understood the learning syntax with the *Quantum Learning model,* (2) students listen to the teacher's explanation of basic competencies, learning objectives, and learning activities that will be carried out, (3) students are very active in working together in group work, (4) students carry out learning syntax with *Quantum Learning* model , (5) students work on Worksheets actively, (6) students work on final test questions with scores above the KKM, (7) students dare to ask the teacher and their friends in a group (8) students are able to make conclusions, (9) students also dare to convey messages and impressions after learning is complete. The recapitulation of student activities in cycle II is shown in the following table:

Table 1.6 Recapitulation of Science Learning Activities

No	Activity	Success Percentage	Success Criteria
1.	Science Learning Activities Before the *Quantum Learning Model is* implemented.	40%	Not enough
2.	Science Learning Activities After the *Quantum Learning Model is* implemented.	90%	Very good

Based on these data, it is evident that all students are enthusiastic about participating in learning, students are more independent, if there are difficulties students ask their group friends, if they are still having difficulties, students ask the teacher. Students are quite good in carrying out group discussions, students' sense of responsibility towards their study groups has increased. Quantum *learning* model can be said to be successful in increasing science learning activities . This is evidenced by an increase in student participation in learning, the enthusiasm of students in conducting experiments and observations. The courage of students to appear in front of the class with full confidence.

So it can be concluded that the *Quantum Learning model* can be the right solution to solve the problem of the lack of science learning activities. This is in accordance with the opinion of Bobby and Herrnacki (2003: 14) which states that the *Quantum Learning model* is an alternative in science learning that brings students to learn in a more comfortable and pleasant atmosphere. Students will be more free in finding new experiences in their learning, so it is hoped that various learning activities that are meaningful for students can grow.

CONCLUSION

Based on the problem-solving method and discussion of the results of the implementation of Quantum Learning, it can be concluded the following: (1) The way to implement the Quantum learning model in science learning is to carry out growth activities. At this stage the teacher provides motivation known as "What Benefits For Me". Motivation is needed in learning because with motivation, the desire to learn will always be there. In this step students will be motivated by the teacher by giving an explanation of what benefits after studying a material.

The next step is a natural activity, students are given the opportunity to conduct experiments on the magnitude and types of forces. All students in the group were actively involved in the experiment. The teacher designs an experiment that requires good group cooperation and all group members are involved. The next activity is naming. In this activity, students are guided by students in their groups to look for keywords and concepts of the science material being taught. This activity aims to train students to be confident and think positively.

The next activity is demonstration. In this activity students are given the opportunity to relate personal experiences with new data so that students live and make it a personal experience. In addition, students are also given the opportunity to present the results of group work in front of the class in turn. The next activity is a repeat activity. In this activity, students are guided by the teacher to repeat the science material they have learned. Students are also given the opportunity to confirm that they really know.

The last activity in implementing Quantum learning is celebrating. In this activity the teacher carries out a celebration to connect learning with positive associations (recognition for completion, participation, acquisition of skills, and knowledge) in the form of praise and appreciation for the best students. (2) Based on the results of observations, it is known that science learning activities have increased. Science learning activities increased from 40% before the Quantum Learning model was implemented to 90% after the Quantum Learning model was implemented. For teacher teaching activities also increased from 50% before the Quantum Learning model was implemented to 90% after the teacher implemented the Quantum Learning model in learning activities. This proves that the Quantum Learning method has succeeded in significantly increasing science learning activities.

SUGGESTION

Teachers are expected to implement student-centered learning. This kind of learning can improve student learning outcomes and activities in learning and can make learning more meaningful. Various learning models can be used to create meaningful learning, one of which is the *Quantum learning* model . The results of this best practice can be taken into consideration in applying the learning model . The results of this report can also be used as material for consideration in carrying out learning innovations. Other teachers are expected to innovate on the application of other learning models that can improve science learning outcomes, which include products, processes and scientific attitudes.

REFERENCES

[1] De Porter, Bobbi and Mike Hernachi. Alwiyah Abdurrahman's translation. 2000. Quantum Learning: Make Learning Comfortable and Fun. Bandung: Kaifa.
[2] DePorter, Bobbi. 2007. Quantum Teaching Practicing Quantum Learning in

classrooms . Bandung: Kaifa.
[3] Haryanto. 2004. Science for Elementary School class I1 . Jakarta: Erlangga.
[4] Nasution, S. 1996. Didactic Principles of Teaching , Bandung: Jemmars.
[5] Poedjiadi, Anna . 2005. Science Technology Society of Value-Loaded Contextual Learning . Bandung: Rosdakarya Youth.
[6] Sudjana, Nana. 2005. Assessment of Teaching and Learning Outcomes . Bandung: Rosdakarya Youth.
[7] Sugiyanto. 2008. Innovative Learning Models. Surakarta: District 13 Teacher Certification Committee.
[8] Suyatna, Agus. 2009. The Relationship between Learning Outcomes and Students' Attitudes and Activities In Learning Physics with an Inquiry Approach , Paper: Physics Education Study Program, FKIP University of Lampung.