

Application of Quantum Teaching Learning Model to Improve Student Learning Outcomes

¹Goman Rumapea, ²Edi Syahputra, ³Edy Surya

State University of Medan, Indonesia

Abstract: The research aims to find out the increase of student learning outcomes on the subject of algebra operation after the implementation of quantum teaching model. Quantum teaching is the converting the kind of interaction into the light which occurs at the learning activities. The subject matter in Quantum teaching is associated with the general student experience so the learning not abstract anymore, it is the point cause quantum teaching be the effective and efficient learning model. The kind of research is classroom action research, that is the research be intended for the share information how the great action for increasing student learning outcomes. The research was done in SMP Negeri 1 Setia Janji in academic year 2011/2012 exactly on the 38 students class VIIIC. The object in this research is application of quantum teaching learning model for increase the student learning outcomes on algebraic operations. Based on analysis of data at cycle I and cycle II, we can conclude that there is an increase student learning outcomes in study algebraic operations by using quantum teaching learning model.

Keywords: quantum teaching, student learning outcomes.

I. INTRODUCTION

Indonesia is the rich country in natural resources. But the prosperity level of the people of Indonesia are still far from expected, even still below other countries which incidentally has low natural resources. This is because the natural resources of Indonesian nation not in line the qualified human resources. So that Indonesian nation are not able to process and utilize their natural resources well.

The weak of Indonesia human resources is an indicator that education in indonesia is ineffective, in carrying out the functions and objectives of national education. As it is written in undang-undang Sisdiknas no 20 tahun 2003 pasal 3 as follows:

National education serves to develop the ability and character development and civilization of the nation's dignity in the context of the intellectual life of the nation, is aimed at developing students' potentials in order to even become a man of faith and the fear of god almighty one, noble, healthy, knowledgeable, skilled, creative, independent and become citizens of a democratic and accountable.

The government has been trying to fix the Indonesian education. It is seen from the actions taken by the government to improve the curriculum, hold teacher training activities, accommodate the subject teacher' discussion (MGMP), provision of school operational funds (dana BOS), facilitating teachers to improve their education to a higher level, concerned with the welfare of teachers. moreover the government has allocated up to 20% of the state budget for education, as tangible evidence seriousness of the government in improving education in Indonesia. Although effort have been made to improve education but the results achieved by students particularly subjects of mathematics still low

Accordance Pranoto's opinion, maths expert from Bandung Institute of Technology on Friday, 24th June 2011 (<http://edukasi.kompas.com/read/2011/01/31/20092036/Mau.Dibawa.Kemana.Matematika.Kita.>) [1]:

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The victory of Indonesian students in various International Olympic event apparently did not make the quality of Indonesian students increased. On the contrary, about 76.6 percent of junior high school students turned out to be rated "blind" math. Calculated on a scale of 6, students' mathematical abilities Indonesia only at the level of the 2nd. Ironically, the conditions endured since 2003. This means that for seven years, these conditions remain stagnant alias unchanged.

This condition in accordance with the researcher's observation on 15-16 April 2011 in SMP Negeri 1 Setia Janji towards 29 students in class VIIIA. Regarding the less favored subjects was 75.86% respondent chose Mathematics. While the students' opinions on the subjects of Mathematics is: 62.07% of respondents find it difficult and unattractive, 31.03% of respondents think indifferent, and only 6.90% of the respondents believe that the math easy and fun.

Researcher also do observations at the school, about student learning outcomes in mathematics on the subject of algebraic operations. Researcher gave 30 minutes for students to answer six essay questions. The results of the observation showed that most students still do not understand the concept of addition, subtraction, multiplication and division of algebraic form. Students also are confused about the numbers constants and coefficients of a variable.

To response above the problems, the teachers need to consider the use of learning model in the learning process (PBM) so the learning more attractive, efficient and effective. One model of learning that can overcome this challenge is Quantum Teaching's learning model. The learning model is expected able to provide a solution for teachers in teaching mathematics and overcome the difficulties of students in understanding the subject matter. Based on the Syaefudin's opinion (2009) [2]:

"Quantum learning is one of the models, strategies, and learning approaches particularly concerning teachers' skills in designing, developing, and managing learning systems so that teachers are able to create an effective learning environment, exciting, and have life skills. Thus the quantum learning model is a form of innovation changing assortment of interaction that exist in and around the moment of learning. These interactions include elements of effective learning that affect student success in learning. From the interaction of changing students' natural abilities and talents into light which would be beneficial for themselves and for others "

DePorter (2005) [3] declare:

"Quantum teaching string up the best of the best into a package multisensoris, multi intelligence and compatible with the brain, which finally it will increases significantly the teacher ability to inspire their student become achievers. As an learning approach that is fresh, flowing, practical and easy to applied, Quantum Teaching offers a synthesis of the things that you are looking for: it is new ways to maximize the impact of your teaching efforts through the development of relationships, changing learning and the implementation of curriculum "

2047 student population (37% low income, 83% African-American, 13% Caucasian, 4% other) 452 faculty. Approximately 60 teachers and 600 students were involved in the Quantum Learning Pilot Program. Post intervention data indicated increased student learning, attendance, and improved attitude toward school. Students also showed increased math and reading skills, both on standardized tests and class grades. Post intervention data also revealed improved teachers effectiveness and satisfaction. Ninth grade "low-level" students in math and English increase their mathematical problem solving ability to 9th grade level, Students had 2.9, fewer periods absent, a significant gain in this highly transient population, According to the Normal Curve Equivalent (NCE), students accelerated their learning and skills equivalent to 21 instructional months' growth (more than two school years) in only 22 days. (Sarah, 1998) [4]

The research of quantum teaching has been investigated by Klara on the subject matter "geometry flat side" obtained 86.48% of 37 students pass the subject while only 13.52% is not pass. The weakness of the researcher did not control well Quantum Teaching learning model so that researcher can not apply the model of Quantum Teaching well

Based on the clarification above, researcher is interested in conducting research about "Application of Quantum Teaching Learning Model to Improve Student learning outcomes"

Research purpose:

This study aims to know whether the application of quantum teaching learning model can improve student learning outcomes on the subject of Algebra Operation in class VIII SMP Negeri 1 Setia Janji in the Academic Year 2011/2012

Benefits of the research:

This research was conducted with the hope of benefits include:

1. As an input for SMP Negeri 1 Setia Janji especially the math teachers about the importance of Quantum Teaching's learning model in learning Algebra Operations.
2. As a guide for researcher in performing the task as a math teacher, to improve student learning outcomes

II. THEORITICAL REVIEW

Sulistiyowati (2001) [5], says that: Learning is an effort to obtain intelligence or knowledge by reading and practicing, so there is a change that was not knowing to knowing, which is caused by experience. Meanwhile, according to. Garret (in Sagala, 2009) [6] learning is a process that occur in the long term through training or experience that leads to change ourselves and change the way react to a stimulus. While Slameto (2003) [7] defines learning is a effort process by person to obtain a new change in behavior as a whole, as a result of his own experience in interaction with the environment

Learning is a process of permanent change in behavior because of the experience and training. The Change in behavior that obtained is the result of learning. Abdurrahman (2009) [8] says: The result of learning is the ability which obtained child after they through learning activities. Learning itself is a process of a person who tried to obtain a form of behavior change that permanent relatively.

Sudjana (2009) [9] argues that the learning process is the activities performed by the students to achieve learning objectives, while learning outcomes are the abilities of the students after receiving their learning experience. It is also stated by Hamalik (2010) [10], he says that: the learning outcome is a change in behavior of someone who has undergone a process of learning, for example, from not understand being understood. The human behavior in question consists of a number of aspects such as: knowledge, understanding, habits, skills, appreciation, emotional, social relationships, physical, character and attitude. Taurina (2015) [11] Learning outcomes are described as written statements of what a learner is expected to know, understand and/or be able to do at the end of a period of learning.

Kenny and Desmarais (2011) [12], learning outcomes: help to provide clarity, integration and alignment within and between a sequence of courses; promote a learner-centred approach to curriculum planning; encourage a self-directed and autonomous approach to learning, as students can take responsibility for their studies, and are able to actively gauge their progress; promote a collegial approach to curriculum planning, as instructors collaborate to identify gaps and redundancies; ensure that decisions related to the curriculum and learning environment are streamlined; foster a philosophy of continual monitoring, evaluation and improvement; and help to ensure accountability and assure quality of our education program

Learning outcomes is a product of the learning process which covers two aspects: cognitive and affective outcomes (Asgari and Borzooei, 2013) [13]. Ewell (in Asgari and Borzooei, 2013) [13] say that cognitive outcomes refer to the development of knowledge and professional skills while non-cognitive outcomes focus on changing the attitudes and values of individuals

According Dimiyati and Mudjiono (2006: 250-251) [14]: learning outcomes are the thing that can be viewed from two sides, namely the student's side and teacher's side. From the student side, learning outcomes is a level of mental development is better than it was before the study. The level of mental development is realized on the types of cognitive, affective, and psychomotor. From the teacher's side, learning outcomes is the time after completion of learning materials.

Piccoli, et al (2001) [15] defined learning outcomes as the changes in a learner's knowledge, skills and attitude after receiving instruction. Watson (Maher 2004) [16] defines a learning outcome as 'being something that students can do now that they could not do previously ... a change in people as a result of a learning experience'. It has long been recognised that education and training are concerned with bringing about change in individuals, and the use of learning outcomes to describe these changes is certainly not a new practice. Jones (1996) [17] says, the learning outcomes are affected by factors such as the learning style, curriculum design and how instruction is provided

Based on clarification above, it is concluded that learning outcomes is the ability owned by students comprise cognitive, affective and psychomotor, the ability is obtained after students receive their learning experience.

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Adamson, et al, (2010) [18], The importance of learning outcomes will increase for several reasons. Firstly, learning outcomes make qualifications more transparent for students. Then, the range of graduates is becoming wider and thanks to learning outcomes, employers may have a better understanding of the acquired knowledge, skills and competences in order to recruit the most suitable candidate. Learning outcomes benefit for quality assurance as they increase transparency and comparability between qualification standards. Learning outcomes are also valuable in terms of course design. Lee et al, (2011) [19] say that learning outcomes are directly evaluated using students' academic records at school, the ability to obtain occupational certificates and results of exams taken outside school. The learning outcomes in this research focused on academic achievements at school. It is the test results a student achieved after completing in a school-based learning process;

Quantum Teaching consists of two words "Quantum" and "Teaching". The word of Quantum is borrowed from the physics's world which means the interactions that converts energy into light. Quantum physics, assumes that new properties come out when ordinary existence combine or get in touch. Accordingly, the whole is more than total of the parts. Every Quantum piece has the multiple potential of being elastic about time and ground, and the capacity to effect the world. According to uncertainty principle, acquiring certain data is almost impossible. Relationships are non-linear and there is a mutual causality. In Quantum, systems show variation, clearness, complexity, mutual causality and uncertainty, reflecting qualitative changings more than quantitative changings (Bahaddin and Yusuf, 2014) [20]. So definition of Quantum Teaching is changing assortment of interaction becomes light that occurs in learning activities.

DePorter (2005) [3] says that:

Quantum is the interaction that converts energy into light. Quantum Teaching is orkestrasi of various interactions that exist in learning and the moment of learning. These interactions include elements for effective learning that affect student success. These interactions change students' natural abilities and talents into a light that will benefit themselves and others

Quantum Teaching focuses on the dynamic relationship in a classroom environment. The dynamic relationship that meant is the interaction that establish a foundation and framework for learning. This learning model removing the obstacles that deter the natural learning process, for example deliberately to using music, coloring the surrounding environment, compile the appropriate teaching materials, how effective presentation and the involvement of active students. Butzin (Gunarhadi, 2014) [21] say that Quantum teaching-learning begins with a strong belief foundation that: all people can learn, people learn differently, and learning is effective when it is joyful, engaging, and challenging.

The main principle of Quantum Teaching according DePorter (2005) [3] is guided by the concept: bring their world to our world and our world Take to their world. It means to get the right of teaching, the first of all teachers must build the authentic bridges enters the student's life. Learning involves all aspects of the student's personality (thoughts, feelings, and body language) besides the knowledge, attitudes and beliefs. Therefore teachers in guiding students in the learning process should truly understand the situation, conditions and ability of students

Quantum Teaching have a principle that similar to the main principle bring their world to our world and our world take to their world. Those principles are:

Everything speaks

The point is the whole of the classroom environment, teachers' body language, learning design should be designed to be able to carry the message of learning that can be accepted by the students.

Everything has a purpose

Each activities of learning undertaken by teachers without exception must have a clear purpose and controlled

Experience before naming

Our brains are developing rapidly in the presence of complex stimuli, which will stir curiosity. Therefore, before the students learn to give names (define, conceptualize, distinguish, categorize) should have had the experience of information related to efforts to provide the name

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Acknowledge every effort

Every student's effort in learning must be given recognition by teachers and other students. This recognition is important so the students always bold to step into the next section in learning

if it is worth learned then it also the worth celebrated

Every effort and results obtained by students in the learning worth celebrating. Celebrations provide motivation and feedback on progress and improve the next learning outcomes.

Quantum teaching has a framework known as TANDUR (Grow, Experience, Naming, Demonstrate, Repeat, and Celebrate)

Grow

Grow the student's learning interest with provides students a view that the subject matter delivered will benefit the lives of the students.

Experience

Create or bring common experiences that can be understood by all students.

Naming

In presenting the material of learning, the teacher provides keyword, concept models, formulas or input.

Demonstrate

Students must demonstrate the material of learning being taught so that students can master the material well.

Repeat

Repetition will strengthen nerve connections and sharpen students' memory.

Celebrate

Every effort is done by students deserve given recognition. So that students more confident and more enthusiastic to participate in the next material.

Based on the clarification above be concluded that an excess of Quantum Teaching is as follows:

1. the student's Interest increase so the learning is more effective
2. the subject matter is not abstract anymore so it is more easily digested by students
3. it can stimulate students' creativity, because in the learning process, students not only passively accept what is given by the teacher, but the students are expected to be active and creative in solving problems
4. knowledge of the students will be greater because they were given the opportunity to demonstrate their knowledge
5. teachers easy to control the achievement of student learning outcomes, because of the opportunity for students to demonstrate their ability
6. the memory of the students will be sharper because before ending the lesson material briefly repeated by teachers
7. students will be more confident and enthusiastic to participate in the next material
8. Quantum teaching is a learning approach that is fresh, flowing and practical and easy to apply

Research procedure:

According Wiriaatmadja (2008) [22] classroom action research is a social movement to repair and improve the qualifications of teachers, so the teachers feel confident in their profession and thus regain his pride. According to the type of research, that is classroom action research, this study has several stages that form the cycle. In this study conducted two cycles, with each cycle consist 2 meetings.

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The procedure of this study are as follows:

1. The action planning stage

The activities carried out in the action planning stages are:

- creating a lesson plan (RPP)
- preparing the facilities of learning support such as books and LAS
- preparing research instrument, that are: test to assess student learning outcomes and observation sheets to observe the teaching and learning process

2. The action implementation stage

After the plan arranged, the next step is the implementation of the action, as follows:

- The observation sheets given to the observer to observe researcher's ability in applying Quantum Teaching. The observer is math teacher in SMP N1 Setia Janji. The observed data will be input for fix the application of Quantum Teaching at the next cycle
- Researcher apply the Quantum Teaching in accordance with the plan drawn up.

Cycle I

a. The problem:

The problem in this research is the lack of student learning outcomes in mathematics on topic algebra operations. Based on data of early observation that made by the researcher, the findings of this study is the student difficulties in understanding the concept of addition, subtraction, multiplication and division of algebraic expressions. student also difficulties in understanding the constans and the coefficients of a variable.

b. The plan of first action:

Based on the above problem, it will designed the solutions alternative with execute learning by using Quantum Teaching model. The point that are designed are:

- create a lesson plan based on Quantum Teaching model by using measures Grow, Experience, Naming, Demonstrate, Repeat and Celebrate, which aims to improve student learning outcomes
- preparing the Sheet of Student Activity (LAS) to every student of every learning cycle
- preparing the test of student learning outcomes and teacher observation sheet

The steps of the Quantum Teaching model that designed is:

1. teachers grow the student interest by informing the benefits of lessons for them
2. teacher connect student's general experience to the subject matter to be studied
3. the teacher divides the students into groups which consist 3-4 people heterogeneously which include gender, race or level of cognitive ability (low, medium and high)
4. teacher gives LAS to students and the students were instructed to understand the material and sample questions given
5. teachers view students 'understanding about material and instruction that presented in LAS
6. teacher asks students to solve the problems that presented in the LAS in groups. During the students solve the problems, teachers guiding groups who have difficulty to find solving problems
7. the teacher divides the problems contained in the LAS to be presented by each group
8. while one of the group make a presentation, the other groups provide feedback, suggestions and evaluate the results of their own work group
9. teachers ensure that each group has know about the right answer for each problem

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10. the teacher inquire student about the subject matter that they do not understand and explain such material

11. teachers provide an assessment of each group and announced the group that has the best performance and provide the applause.

12. teachers provide reinforcement to students so they learn back at home about material that has learned

Implementation of Action 1

After the plan has prepared well then the next step is the implementation of the action. Researcher teach the student based on the steps of Quantum Teaching. At the end of cycle 1, researcher carry out test to view student learning outcomes that have been achieved after the action on cycle I.

c. observation 1:

The observations do when the implementation of the action. The observation provide feedback and comments on the ongoing teaching. The observations include:

- skills to lesson opening
- manage time and learning models
- material be presented on the LAS
- classroom management and student engagement in learning
- communication with students
- skills to shut lesson

d. Data Analysis 1:

Data obtained from tests of learning outcomes 1 and observations analyzed through four phases, data reduction, data exposure and take conclusions in accordance with the purpose of research.

e. reflexive 1:

In this phase, the researcher reviewing whether exhaustiveness of student learning on algebraic operations have been completed in classical, whether the application of learning activities with a model of Quantum Teaching is appropriate as planned. If not, then resumed to the cycle II

Cycle II

When the outcomes of student learning have not been achieved in cycle I, then the action still needs to be continued in the cycle II. In cycle II the planning are held back by referring to the results of the reflection on the cycle I. The implementation of cycle II held based on the planning that has arranged back.

Students will carry out the test of student learning outcomes II, at the end of cycle II. It aims to know whether the student learning outcomes increased from cycle I. The research is stopped in the cycle II If the learning outcomes has increased and achieved the classical exhaustiveness, if not then research will be continued in the third cycle

Data and Data Analysis Techniques:

Data were analyzed as follows:

1. analyze the level of student mastery on the subject matter algebra operations of
2. analyze the students' learning exhaustiveness
 - exhaustiveness of students' learning (individual)
 - exhaustiveness of students' learning in the classical
3. analyzing the achievement of learning indicators

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Description of Improved Learning Outcomes of student learning increase if:

1. fulfilled the classical learning exhaustiveness criteria, that is 85% of the overall number of students have mastery percentage towards learning over 65%
2. exhaustiveness of learning indicators at least 75% of all indicators of learning

Data analysis:

The results of initial tests that were conducted on 38 students with maximum score of 100, obtained the level of student mastery shown in Table 1.

Table 1: Level of Mastery Students Based on Scores of Initial Test

Scores	The Number of Student	Category
0	7	Very Low
2	14	Very Low
4	2	Very Low
6	1	Very Low
7	4	Very Low
9	1	Very Low
11	1	Very Low
12	3	Very Low
13	1	Very Low
14	1	Very Low
18	1	Very Low
24	1	Very Low
26	1	Very Low

It can be concluded that the initial understanding of all students on the subject of algebra operations are still very low. All students gain mastery level below 54%

After conducted the test of learning outcomes 1, the outcomes of student learning are shown in Table 2

Table 2: Skor of learning outcomes 1

Students	Question Number					Total Score
	1	2	3	4	5	
S-01	10	10	15	20	20	75
S-02	10	20	25	20	20	95
S-03	15	10	0	20	20	65
S-04	15	10	15	0	20	60
S-05	10	10	25	0	20	65
S-06	10	20	15	0	20	65
S-07	10	10	15	20	0	55
S-08	5	20	5	20	0	50
S-09	5	20	0	20	20	65
S-10	15	20	0	20	20	75
S-11	10	20	15	20	20	85
S-12	10	20	0	20	20	70
S-13	15	20	25	0	20	80
S-14	10	20	5	20	20	75
S-15	15	10	25	20	0	70
S-16	10	20	0	20	20	70
S-17	5	10	15	20	0	50

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S-18	10	20	15	0	20	65
S-19	15	20	15	0	20	70
S-20	10	20	5	20	20	75
S-21	10	10	15	20	20	75
S-22	10	0	25	20	10	65
S-23	5	20	0	20	20	65
S-24	10	20	5	20	0	55
S-25	10	20	0	20	0	50
S-26	15	20	15	0	0	50
S-27	10	10	0	20	20	60
S-28	10	10	15	20	20	75
S-29	15	20	25	0	20	80
S-30	10	20	5	20	20	75
S-31	5	20	15	20	10	70
S-32	5	10	0	20	20	55
S-33	10	20	15	0	0	45
S-34	5	20	5	0	20	50
S-35	0	20	0	20	20	60
S-36	10	20	5	20	0	55
S-37	10	20	0	20	20	70
S-38	10	20	5	20	20	75
Max Score	15	20	25	20	20	100

Based on table 2, we can determine minimum value, maximum and average, as shown in Table 3

Table 3: Minimum score, Maximum, and Average Students Based on Scores the test of learning outcomes 1

The Minimum Score	45
The Maximum Score	95
Average	66,05

Then, if the above data is categorized based on the student's mastery level, the results are shown in table 4

Table 4: Level Mastery Student Based on Scores of Learning Outcomes 1

Category	The Number of Student	Percentage
Very High Mastery	1	2,63%
High Mastery	3	7,89%
Medium Mastery	21	55,26%
Low Mastery	7	18,42%
Very Low Mastery	6	15,79%
Total	38	100%

Furthermore, from the above data also can be determined the percentage of student's learning exhaustiveness. the percentage of student's learning exhaustiveness are shown in Table 5

Table 5: The Percentage of Student's Learning Exhaustiveness

Category	The Number of Student	Percentage
Complete	25	65,79%
not complete	13	34,21%
Total	38	100%

Based on the above table it can be known that as many as 25 students from 38 students (65.79%) had completed the study. While students who have not completed the study was 13 (34.21%).

The Achievement of Learning Objectives (Indicators)

Specific learning objectives (indicators) formulated in this study are:

1. understand the coefficients, variables, constants and the like terms
2. resolve the operations of addition and subtraction on the algebra
3. resolve the operations of multiplications, divisions and exponentials in the algebra

Based on the score of each item on the outcomes test of student learning 1, the achievement of TPK (indicator) can be presented in Table 6.

Table 6: Description of exhaustiveness TPK (indicator) on Cycle I

TPK Number	Question Number	Completed Student	Percentage	Explanation
1	1	30	78,95%	Tuntas
2	2	26	68,42%	Tuntas
3	3 4 5	15	39,47%	Tidak Tuntas

Based on the above table as much as 2 TPK has been completed and 1 TPK incomplete. Thus the percentage exhaustiveness of TPK is 66.67%.

Reflection:

From the analysis of the above data was obtained only at 65.79% (25 students out of 38 students) have been completed their study. While 34.21% (13 students) is still incomplete. Thus mastery the students on the algebraic operations in cycle I is not completed in the classical exhaustiveness. While the achievement of specific learning objectives (TPK), there are two of a total of 3 TPK has been reached. This means that the percentage of achievement of TPK is 66.67%. Achievement of TPK 66.67% still categorized as uncompleted. It need to re-learning by Quantum Teaching that permitting increased learning outcomes in the cycle II

CYCLE II

After conducted the test of learning outcomes II, it's obtained data about student learning outcomes II that shown in table 7

Table 7: The Scores of Student Learning Outcomes II

Student	Question Number					Score Total
	1	2	3	4	5	
S-01	15	20	20	20	0	75
S-02	15	20	20	20	25	100
S-03	15	20	20	20	0	75
S-04	15	20	0	20	25	80
S-05	15	5	20	20	15	75
S-06	15	20	10	20	0	65
S-07	15	20	20	5	0	60
S-08	15	20	0	20	0	55
S-09	0	20	20	20	25	85
S-10	0	20	20	20	25	85
S-11	15	20	20	20	15	90
S-12	15	20	20	20	15	90
S-13	15	20	20	0	25	80
S-14	15	20	5	20	25	85
S-15	15	20	20	20	0	75
S-16	15	20	20	20	0	75

S-17	15	20	20	20	0	75
S-18	15	5	5	20	25	70
S-19	15	5	20	20	25	85
S-20	15	20	5	20	25	85
S-21	15	20	20	20	15	90
S-22	0	20	10	20	25	75
S-23	15	20	20	20	0	75
S-24	15	10	20	20	0	65
S-25	15	20	20	20	0	75
S-26	0	5	5	20	25	55
S-27	15	20	20	20	0	75
S-28	15	20	20	20	25	100
S-29	15	20	20	20	5	80
S-30	15	20	20	5	25	85
S-31	15	20	5	20	15	75
S-32	15	20	20	20	15	90
S-33	15	5	5	20	15	60
S-34	15	20	10	20	0	65
S-35	15	20	0	0	25	60
S-36	15	10	20	20	0	65
S-37	15	20	20	20	0	75
S-38	15	20	20	20	0	75
Maxs Skor	15	20	20	20	25	100

Based on the data on table 7, it can be specified minimum value, maximum and average, are shown in Table 8

Table 8: Minimum scores, Maximum and Average of Student Learning Outcomes II

Minimum score	55
Maximum score	100
Average	76,45

Then, if the above data is categorized based on the student's mastery level, the results are shown in Table 9.

Table 9: The Student's Mastery level Based on Student Learning Outcomes II

Category	The number of student	Percentage
Very high mastery	6	15,79%
High mastery	9	23,68%
Medium Mastery	18	47,37%
Low mastery	5	13,16%
Very low mastery	0	0%
Total	38	100%

Based on the above data, we also can determine the percentage of student's exhaustiveness. The percentage of student's exhaustiveness in the cycle II are shown in Table 10. According to the table 10 can be known that as many as 33 students from 38 students (86.84%) had completed the study. While students who have not completed the study only 5 votes (13.16%).

Table 10: Percentage of student's Exhaustiveness on Cycle II

Kategori	Banyak Siswa	Persentase
Tuntas	33	86,84%
Tidak Tuntas	5	13,16%
Total	38	100%

The Achievement of the specific Learning Objectives (Indicators):

Specific learning objectives (indicators) formulated in cycle II in this research are:

1. Factoring the algebraic expressions
2. Resolving the algebraic fractions and simplify

Based on the score of each item on the learning outcomes II, the achievement of TPK (indicators) are shown in Table 11.

Table 11: Description of exhaustiveness TPK (indicator) Cycle II

TPK Number	Question Number	The Completed Student	Percentage	Explanation
1	1	30	78,95%	Complete
	2			
	3			
2	4	25	65,79%	Complete
	5			

From the table above shows that all of TPK (2 TPK) has been completed. Therefore, the percentage of exhaustiveness TPK is at 100%.

The analyze of the above data obtained that 35 students (86.84%) of total students (38 students) have been completed the study. While incomplete only amounted to 13.16% (5 students). Thus student's exhaustiveness on algebraic operations in the cycle II has been completed in the classical. Likewise, the percentage of specific exhaustiveness objectives (TPK) is 100%. All of the TPK (2TPK) has been completed.

III. RESULT AND DISCUSSION

Based on the results of initial tests that conducted before implementation of Quantum Teaching model, we known that all students have mastery level is very low on the algebra operations. The average score of the initial test was 5.82. After the learning in cycle I by applying the model of Quantum Teaching, the average score of outcomes learning obtained 66.05. The student's exhaustiveness in classical is 65.79%, 25 students have completed the study and 13 students incomplete. The percentage achievement of specific learning objectives (TPK) gained 66.67%, 2 TPK from total of 3 TPK has been completed. Furthermore in cycle II, the average score of learning outcomes obtained 76.45. The student's exhaustiveness in classical is 86.84%, 33 students have completed the study and 5 students incomplete. About the specific learning objectives (TPK), all of TPK (2 TPK) has been completed. It means that the percentage of exhaustiveness of TPK amounting to 100%.

If we compare data in the cycle I and the cycle II is obtained an increase 10.4 point in the average score of learning outcomes. The percentage of student's exhaustiveness in classical increase 21.05%. While the percentage of exhaustiveness of specific learning objectives (TPK) an increase of 33.33%.

Based on the discussion above, it is concluded that there is an increasing in student learning outcomes after applying the model of Quantum Teaching on the subject of algebraic operations in class VIII SMP Negeri 1 Setia Janji in Academic Year 2011/2012. This is consistent with previous studies conducted by Dianto (2009) which shows that the application of the model Quantum Teaching can improve student learning outcomes on the fraction matter in class V SD PAB 8 Saentis Percut Sei Tuan in 2009/2010. In that study, the average of learning outcomes increase 5.1 point from the cycle I to the cycle II, and the exhaustiveness in classical increased 20%.

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