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The Implementation of Quantum Teaching (QT) and Think Talk Write (TTW) through Lesson Study to Improve Students' Learning Motivation

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Abstract

The research was intended to improve students' learning motivation at study and learning course for fifth semester of Biology Education. Classroom Action Research has been conducted in two cycles with four phases from each cycle. Each cycle has been done based on lesson study consisting of *plan, do*, and *see*. The data were collected using a questionnaire of students' motivation and motivation questionnaire of the observer which were measured through aspects of *attention, relevance, confidance*, and *statisfaction*. Then data are analyzed in quantitative descriptive. The results showed that the feasibility of learning syntax on each cycle has a constant value of 100%. The average feasibility of lesson study in cycle I and II are 98.98% and 100%. The result of the average adherence to learning syntax in cycle I and II is 100%. Based on the result of the questionnaire filled by the observer shows an increase in motivation to learn between cycle I and II by 12.6%, while the average results of the students' motivation questionnaire showed an increase of motivation to learn by 6%. The application of learning model using Quantum Learning and *Think Talk Write* can boost the students' motivation to learn.

1. Introduction

Education can improve one's quality if it is received and obtained well (Barrett et al., 2006), so that education can make someone have a more meaningful life (Barrett et al., 2006). Education can be defined as a process of changing students'behavior to become mature persons who are able to live independently and become the members of society (Sagala, 2010).

Education at school should be given well and effectively. Quality education requires educators who have good self-ability. Educators must be able to create an active, effective and efficient learning process. Such a learning process will accommodate students to achieve quality improvement in three domains: cognitive, affective and psychomotor. Learning process can succeed if most of the learners can be actively involved both physically and mentally in the learning process (Mulyasa, 2012).

Learning can be seen as a process that is directed to the goals and processes of doing through various experiences (Rusman, 2013). Learning is a planned experience that brings about change in behavior. In the process of teaching and learning, teachers are required to be able to motivate students to tend to be active in learning. In addition, learning motivation also affects one's learning achievement (Syukur, 2014). In line with Aunurrahman (2009), in active students is an important and fundamental issue that must be understood and developed by every teacher in the learning process. In active students need to be explored from their potentials through their activities to achieve learning objectives. (Hamalik, 2012).

During the observations conducted in the Study and Learning Course at Class B of fifth semester on August 30, September 1, September 6, September 8, September 11 and September 13, 2016, researchers found some problems that occur in the classroom related to students' motivation and learning achievement. The learning motivation indicators adopted by Keller (2010) are attention, relevance, confidence, and satisfaction. The data of the observation show that most of the students have not met these four indicators. It is proven from the fact that for 16 students, only 30% (4-5 people) students who are actively involved in the learning process. Other students seem less attention to the learning process. It can be known from so many students who still have talked with colleagues besides him when the lecturer delivered the materials. Furthermore, students still have a lack of confidence. This is proven by the least active role of students in the process including in question and answer section. Besides, the student found difficulties in relating the learning materials to real circumstances in their lives.

Based on the results of these observations, it can be concluded that students' motivation is still relatively low. This is due to the learning method which is not good and less interesting for students. It is necessary to note the students' learning motivation in the classroom because motivation can affect the high or low learning outcomes obtained by students (Slavin, 2009; Palupi et al, 2014).

Students' motivation can be seen from their role in learning activities (Uno, 2011: Bakar, 2014). From the results of this observation. It shows that students have not played an active role, so it can be said that the learning process has not run well. Educators are expected to make innovations in the learning process to improve students'

motivation and learning achievement, such as applying an interesting model of learning and encouraging students' motivation.

Knowing that students have different learning characteristic and background, the appropriate learning model which can be applied is Quantum Teaching (QT). Quantum Teaching (QT) learning model is known to increase students' self-efficacy so that it will improve students' learning achievementto get better (Hinton et al, 2008; De-porter et al., 2010). Thus, it can be said that this model can improve students' learning motivation. According to Yulianti et al. (2014), she explained that Quantum Teaching (QT) learning model can optimize the cognitive, affective and can attract students'interest in learning. Learning achievement can be improved through students' participation in groups using cooperative learning (Slavin, 2009).

Quantum Teaching (QT) learning model is known to improve learning achievement in the classroom (Qurnain & Peni, 2013). Meanwhile, *Think, Talk, and Write* (TTW) model will guide students in the process of speaking and sharing ideas with their friends (Sanjaya, 2013) and building understanding through thinking, speaking, and writing (Hunker & Laugin in Yamin & Ansari, 2013; Utami et al., 2014). From the results of the research conducted by Sunigsih (2014), it is explained that the TTW model is more effective than lecturing method.

In the effort to maximize learning, the study combined Quantum Teaching (QT) learning model with *Think, Talk, and Write* (TTW) learning model. The combination of these two models creates a more interesting learning atmosphere. The advantages of both models are expected to increase students' learning motivation in the classroom. Hence, this study was intended to improve the motivation of biology students in the Study and Learning Course for the fifth semester.

2. Method

This research adopts classroom action research with qualitative descriptive approach. It was conducted in two cycles with four stages; they are planning, implementing, observing, and reflecting. The Lesson Study is based on activities of plan, do, and see. The research was conducted on fifth semester students of Biology Education Semester at Study and Learning Course. Data were collected through observation and students' motivation questionnaire given at the end of cycle 1 and cycle 2. Students' motivation

questionnaire applied in this study is as supporting data for observation conducted by observer.

Data analysis in this research is done during and after data collection. Data analysis in this study is described as it follows.

1. Observation Sheets for *Plan*, *Do*, *See* Stage

Observation Sheets of *Plan*, *Do*, *See* Stage are sheets containing procedure of *plan*, *do*, *and see* in *Lesson Study*. The percentages of application of plan, do, and *see* stage can be calculated through the following formula.

$$\text{Percentage of Implementation} = \frac{\Sigma appeared\ indicator}{\Sigma all\ indicators} \times 100\%$$

Then, the percentage criterion obtained from the above formula can be seen in the table 1 below.

Table 1. The Percentage and Implementation Criterion of *Plan*, *Do*, and *See* Stage (Arikunto, 2009)

Percentage of Implementation	Criterion
80-100	Strongly Implemented
66-79	Implemented
56-65	Enough Implemented
40-55	Less Implemented
30-39	Very Less Implemented

2. Observation Sheets for the Application of *QT* and *TTW* Learning Models

The observation sheets of the implementation of QT learning combined with TTW are sheets containing the steps of QT learning implementation combined with TTW starting from planning, implementation of learning, classroom management, and assessment done at the *do* stage in this Lesson Study. The percentage of QT combined with TTW is calculated using the following formula. Then, the percentage criterion obtained from the above formula can be seen in table 2 below.

$$\text{Percentage of Implementation} = \frac{\Sigma appeared\ indicator}{\Sigma all\ indicators} \times 100\%$$

Table 2. The Percentage and Implementation Criterion of *QT* combined with *TTW* Learning Models (Arikunto, 2009)

Percentage of Implementation	Criterion
80-100	Strongly Implemented
66-79	Implemented
56-65	Enough Implemented
40-55	Less Implemented
30-39	Very Less Implemented

3. Observation Sheets for Motivation

The result of students' learning motivation includes four aspects, they are: attention, relevance, confidance, and statisfacion. Observation sheets were observed in every meeting which was attended by each student. In this study, each cycle has two lesson studies, so the total motivation score for each student is by taking the average (*mean* score). The mean score of each aspect is used to calculate the percentage of motivation in every aspect classically. After calculated, the data are categorized based on the following table.

Table 3. The Criterion Percentage for Students' Learning Motivation (Arikunto, 2009)

Percentage of Success (%)	Motivation Quality	Grade
80-100	Very Good	A
66-79	Good	B
56-65	Fair	C
40-55	Less	D
30-39	Failed	E

4. Students' Learning Motivation Questionnaire

This study applied a student questionnaire consisting of 20 statements. Answer statements use scale (1) strongly disagree, (2) disagree (3) hesitate (4) agree, and (5) strongly agree. The students choose the answer according to the conditions during the learning instruction. Motivational aspects include: attention, relevance, confidance, and statisfacion (ARCS). Motivation Questionnaire is divided by the end of the cycle I and cycle II in this classroom action research. Percentage of motivation for each aspect can be classically calculated by the following formula.

a. Percentage of attention $= \dfrac{SA}{N \cdot XA \cdot K} \times 100\%$

b. Percentage of relevance $= \dfrac{SR}{N \cdot XR \cdot K} \times 100\%$

c. Percentage of confidence $= \dfrac{SC}{N \cdot XC \cdot K} \times 100\%$

d. Percentage of satisfaction $= \dfrac{SS}{N \cdot XS \cdot K} \times 100\%$

SA : Mean score number in the aspect of *attention*
SR : Mean score number in the aspect of *relevance*
SC : Mean score number in the aspect of *confidence*
SS : Mean score number in the aspect of *satisfaction*
XA : Statement number in the aspect of *attention*
XR : Statement number in the aspect of *relevance*
XC : Statement number in the aspect of *confidance*
XS : Statement number in the aspect of *satisfaction*
N : Number of students
K : Maximal score of each statement

Based on the calculation of formula ARCS, the data were obtained in the form of achievement percentage of each aspect classically. Then, the data are categorized based on the following table.

Table 4. Motivation Percentage and Quality (Arikunto, 2009)

Percentage of Success (%)	Motivation Quality	Grade
80-100	Very Good	A
66-79	Good	B
56-65	Fair	C
40-55	Less	D
30-39	Failed	E

3. Result and Discussion

3.1 The Implementation of *Lesson Study*

The result data of lesson study implementation can be seen from Lesson Study (LS) activity recapitulation which shows that LS implementation has been very good with percentage among 98% -99% in cycle I and increased to 100% in cycle II. This result shows that the cycle I and II has been improved on LS stages. The results can be seen in table 5 and table 6.

Table 5. The Implementation Percentage of Lesson Study in Cycle I

No.	Steps	Meeting	Percentage	Average
1	*Plan*	I	96,87%	98.96
		II	100%	
2	*Do*	I	100%	99.02%
		II	97,06%	
	See	I	96,87%	98,96%
		II	100%	

Table 6. The Implementation of *Lesson Study* in Cycle II

No.	Steps	Meeting	Percentage	Average
1	*Plan*	I	100%	100%
		II	100%	
2	*Do*	I	100%	100%
		II	100%	
3.	*See*	I	100%	100%
		II	100%	

Classroom Action Research through Lesson study in this study was conducted in two cycles in the Study and Learning Course at University of Malang. The implementation of Lesson Study (LS) through monitoring the implementation of plan, do, and see, found that the average implementation of the syntax in cycle I with the criteria is very well implemented. In cycle II, the average is 100% with very well implemented criteria. From this result, it can be seen an increase of 0.5%.

Lesson Study guides educators to focus the discussions on planning (plan), implementation (do), and reflection (see) in the learning instruction. Activity of plan is done to conduct a discussion in the preparation of learning scenarios to be performed and members of LS provide advice to lecturers who will teach the model. Meanwhile, the things discussed are about lesson planning, learning syntax, student worksheets and research instruments that have been made in advance by the researchers. The results of this plan made improvements to learning devices. Plan activities also resulted in the way of organizing teaching materials, learning process, and preparation of best learning aids. All components contained in this learning design are then simulated before being implemented in the classroom. At this stage, it is also set observation procedures and instruments required in the observation.

The implementation of stage of do that have been done maximally, has been successfully implemented and experienced an increase of each cycle. Based on the percentage of results can be seen that the stage does have an increase in each cycle. The obstacles that are often faced at the stage do is processing or timeliness at the time of the modeling student. Students who do modeling often use time that exceeds the time allocation for modeling, so the model lecturer always gives a warning to the students.

Based on the stage of do, in each cycle, there is an increase in involvement or activity in learning. In addition, the involvement of the observer does not occur in the lesson or it can be said that there is no observer intervention during the implementation of the stage do. The observer has a duty to collect all information about students' activities in the learning instruction. The focus of the observation is aimed at the students' reaction to the learning such as the students' attitude toward the learning instruction, the students' attitude toward the group or the response of the students during the class discussion.

The reflection of stage of see is intended to find advantages and disadvantages of learning implementation. At this stage, it begins with a personalized correction by the model lecturer on the process of implementation of learning in the classroom. Some aspects that become the main correction by the model lecturer the readiness of students in the learning process, the increase of students' activeness in the process of learning and improvement of students' movitation in the learning process. Model lecturers also convey some of the enhanced weaknesses in the learning process, such as the increase of the model lecturers' attention to students' activeness evenly and clearlyr by giving rewards to the active group during the learning process.

Furthermore, at the stage of see, it is given the opportunity to the observer to provide criticism and advice delivered wisely without humbling or hurting educators. Those are for the next practice improvement. According to Susilo (2011), all inputs can be redesigned for the next better learning. Based on the results of this study, the merging of two learning models greatly influences the improvement of learning achievement and motivation.

Lesson Study implementation can improve teachers' ability in teaching. According to Doig & Groves (2011), the use of Lesson Study in teaching can improve the professionalism of teachers both in the ability to teach and the ability to understand the material presented. Lesson Study can be also served as a foundation in developing teachers' creativity in teaching (Lewis et al, 2009) and provides an opportunity to improve achievement in teaching (Bakar, 2014). Based on the results of this study, the merger of two learning models greatly influences the improvement of learning achievement and motivation.

3.2 The Implementation of Learning Syntax

Implementation of the learning syntax that has been prepared in the planning has been implemented completely, both on learning in cycle I and cycle II. These results are presented in table 7 below.

Table 7. The Percentage of Learning Syntax

No.	Cycle	Percentage	Average
1.	I	100%	100%
2.	II	100%	

The implementation of learning each cycle experience a constant value of 100%, with the sense that each stage planned on the syntax has been implemented by the model lecturer. But there are still some notes given by the observer to modeling lecturer that is time management in the process of the stage *does*. In the cycle, it was admitted that it still often occurs a delayed duration in the implementation of the learning stages. This is due to the fact that there are still stages of adjusting the class situation in the model lecturer. But over the time, in cycle II, this can be overcome by the model lecturer.

The implementation of learning has been adapted to the existing syntax. Some of learning stages done are that learning starts by providing initial motivation and apperception to students to cultivate their learning interest, this is in accordance with the first stage of QT: 'grow'. Model lecturers convey the purpose of studying the material, so students can imagine what will be achieved by studying the material, so that students can feel the things that will be obtained by studying this material. This step goes into the 'natural' stage.

In the main activity, several stages are 'name' (QT) and 'think' (TTW) stages implemented in the process of worksheets activity by students. Then, it is continued to the 'demonstration' (QT) and 'think' (TTW) stages of showing the learning model of students' creative works as their facilitators to deliver the learning materials. Then, it is continued to learning review that is part of the 'repeat' phase, which aims to solidify learning materials. Students are then invited to write down the conclusions gained from the learning on this day which is included in the 'write' (TTW) stage. The last stage is 'celebrate', by giving awards to the best group in presenting the concept of learning with the model of students' creations.

3.3 Motivation

The data from the students' questionnaire is known to increase motivation between cycle I and cycle II. Some stated that by using QT learning model combined with TTW, the students' spirit of learning increases in Figure I.
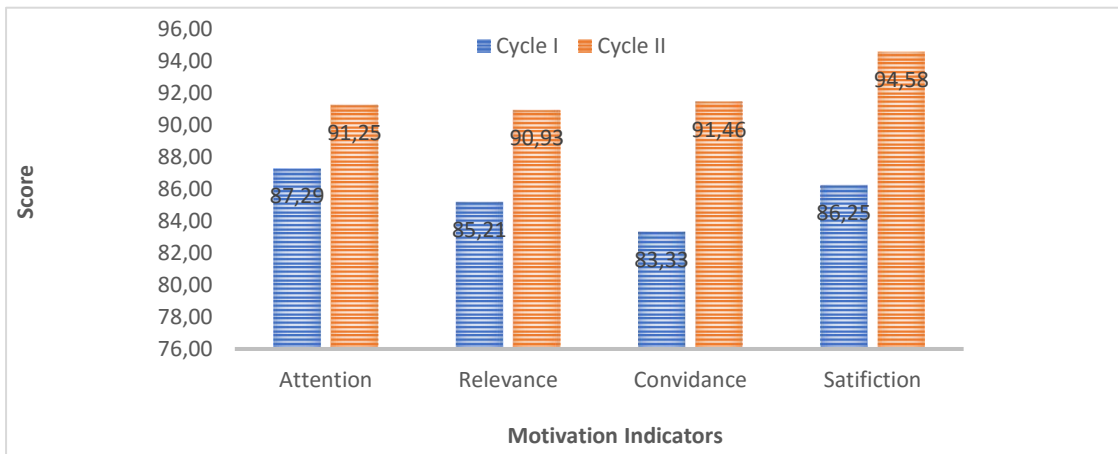
Figure 1. The score of students' learning motivation in the LS cycle based on students 'questionnaire.

The results of the observation conducted by the observer showed an increase in students' motivation from cycle I to cycle II. Observer's valuation is conducted in everylearning of cycle I and II. The results can be seen in Figure 2.
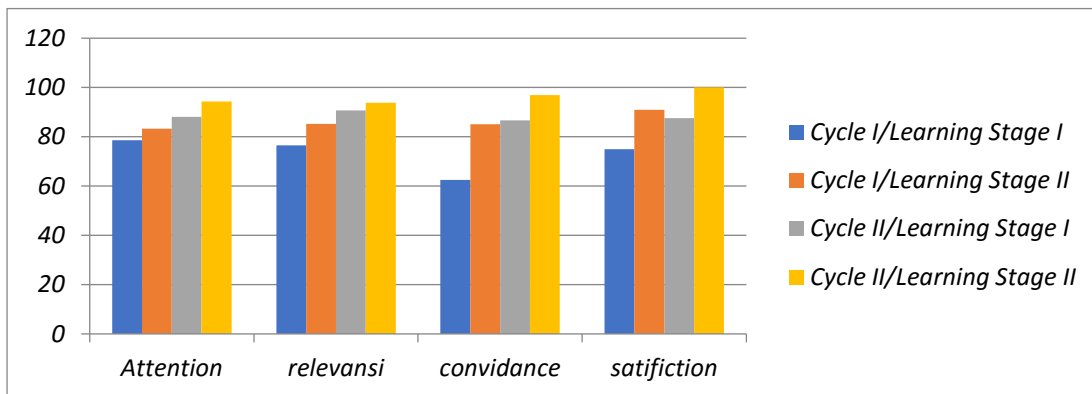

Figure 2. The score of students' learning motivation based on students'questionnaire

From Figure 1 and 2, it obtained the data in the form of average of motivational aspects classically (Table 8).

Table 8. The Achievement Average in the Aspect of Motivation

Cycle/Learning Stage	Achievement Percentage (%)	Quality Criteria for Motivation	Grade
Cycle I/ I	73.18	Good	B
Cycle I/ II	86.16	Very Good	A
Cycle II/ I	88.21	Very Good	A
Cycle II/ II	96.23	Very Good	A

In the implementation of two cycles, it can be seen the increase in students' learning motivation for both the results of student polls and the results of observer's

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questionnaires that there is a 6% increase in motivation. Increased motivation is due to students' interest in the learning process. This improvement is an effort made in cycle 2 that has been designed on the syntax of learning such as giving ice breaking like jargon and happy gymnastics which greatly affect students' learning motivation. Giving apperception with the delivery of learning objectives also greatly affect the motivation to learn, because with that stage, students can think of what they need to achieve after learning the materials. A sense of happiness when starting the learning, can serve as an intrinsic factor in improving the learning spirit (Gillet et al., 2012). Inner motivation (intrinsic factor) can increase students' motivation level (Vibulphol, 2016).

From the research conducted by Kurniawan (2017), it shows that the creativity of the use of learning models will lead to the increase of students' motivation. The research conducted by Yen et al (2010) stated that the new strategy used in learning will lead to increase students' interest in learning. In addition, further research conducted by Lee (2010) concluded that high motivation to learn, can improve one's learning achievement.

Motivation provides a mental boosting that drives and directs human behavior, including learning behavior. Motivation contains the desire, hope, need, purpose, target, and instensivity (Feng et al, 2013). This state of the soul is what controls the behavior in a person. Motivation helps one to increase his learning interest (Burn, 2014). There are three components that encompass one's motivation: need, encouragement, and purpose. Learning motivation can be enhanced through enjoyable learning for students without the effectiveness and core of the material delivered by educators.

Student learning model can be accessed through the pattern of teaching done by an educator (Ullah et al, 2013). From research conducted by Qurnain & Peni (2013), the use of Quantum Teaching (QT) is known superior to other learning, this is because through QT, educators can create a cool and fun learning atmosphere in the classroom. The application of Quantum Teaching (QT) learning combined with Think Talk Write through Lesson Study gives students the opportunity to be active in playing a role in learning, either in answering questions of model lecturer, answering or giving questions during the discussion, and taking an active role in concluding the lesson.

Such students' activities are grown through the improvement of learning motivation individually. This motivation enhancement is done by effectively implementing the

Quantum Teaching (QT) learning model combined with *Think Talk Write* (TTW) learning model through Lesson Study. According to Eshet et al. (2012), the implementation of good learning will trigger good learning motivation also on the students.

4. Conclusion

Based on Quantum Teaching combined Think Talk Write learning Model, it indicates an increase in motivation to learn. This study discusses something about the motivation of learning so that this research can be used as a basis to conduct further research on learning achievement or cognitive aspects of the learning instruction.

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