

Comparison of the *Quantum Teaching Learning Model* and the *Concept Sentence Learning Model* to the Learning Outcomes of Biology in Class X Students at MA Boarding Darul Qur'an

Siti Rohana¹, Indayana Febriani Tanjung¹, Efrida Pima Sari Tambunan²

¹Department of Tadris Biology, Faculty of Tarbiyah, Universitas Islam Negeri Sumatera Utara Medan, Medan, Indonesia

²Department of Biology, Faculty of Science and Technology, Universitas Islam Negeri Sumatera Utara Medan, Medan, Indonesia

Corresponding Author: Indayana Febriani Tanjung

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ABSTRACT

This study aims to determine the comparison of the *quantum teaching learning model* and the *concept sentence learning model* on biology learning outcomes for class X MA students at MA Pondok Pesantren Darul Qur'an. This research is a quantitative research with a *quasi-experimental research type*. The population in this study were all of class X MA Pondok Pesantren Darul Qur'an, totaling 107 students. The sample used in this research is part of the target population consisting of two classes which are determined by *cluster random sampling*. So that the sample used was class X MIA-2 as experimental class I totaling 34 students and experimental class II totaling 34 students. The results of data analysis showed that the average post-test score for experimental class I (*quantum teaching*) was 80.6 (very high category). Whereas in the experimental class II (*quantum teaching*) an average post-test score of 68.14 (high category) was obtained. Testing the hypothesis of differences in biology learning outcomes for students in experimental class I and experiment II, obtained $t_{count} = 9.025 > t_{table} = 1.997$, then H_0 is rejected and H_a is accepted. This shows that there are differences in biology learning outcomes for students who are taught using the *quantum teaching learning model* and those who are taught using the *concept sentence learning model*.

Keywords: [Learning Outcomes, *Quantum Teaching Learning Model*, *Concept Sentence Learning Model*]

INTRODUCTION

Mandate of Law No. 20 of 2003 concerning the National Education System, it is very clear that education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and skills needed by himself, society, nation and state (Faizah, *et.al.*, 2017).

In general, education can be described as a unit between several subsystems and forms a unified whole. This education system obtains input from the supra-system (society and environment) and provides results or output for the supra-system. The subsystems that make up the education system include: objectives, educators, students, management, structure and timetable for learning, materials, implementation or managers, media and learning resources, technology, facilities, quality control, research and financing. The functional interaction between the education subsystems is called the educational

process. In the educational process Learning and learning have become a central issue. Learning is an effort made by external factors so that the learning process occurs in individuals who learn. Self-study is a process to achieve a learning goal. A person is said to have learned if his behavior shows a change, the change that occurs can be a positive or negative change in behavior depending on the learning objectives. The changes that occur are called learning outcomes. Student learning outcomes are a benchmark in learning (Tanjung, 2018).

Achieving maximum learning outcomes in the world of education today needs to be developed through various learning models. In general, the learning model is a reference or guideline for interaction between teachers and students concerning learning strategies, approaches, methods and techniques and includes ways to make a learner achieve the expected learning goals (Karwono and Heni Mularsih, 2017).

Based on observations and interviews conducted by researchers in class X MA Pondok Pesantren Darul Qur'an , the problems that arise in studying biology at MA Pondok Pesantren Darul Qur'an include the low student learning outcomes in biology learning, seen from the results of the final semester one test for the subject of Biology at the MA Pondok Pesantren Darul Qur'an is still below the KKM (ie 70). Based on the scores obtained from the Biology teacher, Mu'allimah Darmawati, S.Pd, it was shown that only 16 out of 35 students were able to achieve the KKM. Which is caused by a lack of understanding of the subject matter given by the teacher to students so that student learning outcomes are low or below average according to information from the Biology teacher concerned. An unpleasant learning atmosphere also makes students get bored quickly, as explained by a class XI-1 student. According to him, studying biology has been very serious and uninteresting so that he considers studying biology very boring. The application of learning strategies that are not varied is thought to be

the main cause of the lack of student learning outcomes. To overcome this, research will be carried out as a solution to solve the problem.

Improving student learning outcomes needs to be done in fun learning situations and stimulates activeness to enthusiastically play an active and creative role in the learning process. Responding to this problem, an appropriate learning model is needed in order to improve student learning outcomes in Biology at the MA Pondok Pesantren Darul Qur'an .

Currently the learning models developed are very many and varied. The *Quantum Teaching Learning Model* is one of the learning models developed based on the view of constructivism. This model familiarizes students with fun learning so that it is hoped that it can increase student learning interest and in the end can improve student learning outcomes as a whole.

Quantum Teaching is a learning model that combines various positive suggestions and their interactions with the environment that can affect one's learning processes and outcomes. *Quantum teaching* is learning that allows students to learn at an impressive speed, with normal effort and accompanied by joy. *Quantum teaching* is tips, instructions, strategies and the entire learning process that can sharpen understanding and memory, and make learning a fun and rewarding process. A pleasant learning environment and the emergence of emotions as brain involvement can create a good interaction in the learning process which can ultimately lead to high motivation in a person, so that it can directly affect the learning process (Mujahidin, 2017).

From cognitive psychology experts, a learning model was developed called *concept attainment* , which was further developed into a *Concept Sentence learning model* . *Concept Sentence learning* is learning that is more directed at interactions between teachers and students (Huda, 2018).

Based on the background above, the authors intend to conduct research with the title "Comparison of *Quantum Teaching Learning Models* and *Concept Sentence Learning Models* Against Biology Learning Outcomes of Class X MA Pondok Pesantren Darul Qur'an".

MATERIALS & METHODS

This research was conducted at the Darul Qur'an Islamic Boarding School MA. The time of the study starts from January to February. The population in this study were all 107 students of class X MA Pondok Pesantren Darul Qur'an which were divided into 3 classes, namely class X MIA -1, X MIA - 2, and X MIA - 3. Class X MIA -1 consists of 38 students, class X MIA - 2 consists of 35 students, and class X MIA - 3 consists of 34 students. The sample used in this study is part of the target population consisting of two classes determined by *cluster random sampling*. so that class X MIA - 2 consisting of 35 people is obtained as the experimental class I which is taught with the *Quantum teaching* learning model and class X MIA - 3 consisting of 34 people as the experimental class II which is taught by the *Concept sentence learning model*. This type of research is a *quasi-experimental* with a quantitative approach to the design used in this study *pretest posttest co- mparison group design* with two different treatment groups. The research design can be seen as follows:

Table 1. Research Design

Group	Pre-test	Treatment	Post-test
A	O ₁	X ₁	O ₂
B	O ₁	X ₂	O ₂

Information:

- A : Experimental Group I
- B : Experimental group II
- X₁ : Treatment taught with the Quantum Teaching learning model
- X₂ : Treatment taught with the Concept sentence learning model
- O₁ : Initial test (pretest)
- O₂ : Final Test (post-test)

The instrument used in the research to measure students' cognitive learning outcomes in ecosystem material is a multiple choice test of learning outcomes totaling 30 items given before and after treatment. The steps for the instrument validation technique in the study are as follows: (1) Test the Validity of the Test; (2) Test Reliability; (3) Test difficulty level; (4) Discriminatory Test. Data analysis techniques in the form of descriptive analysis and inferential analysis (Normality, Homogeneity, and Hypothesis).

RESULT

Quantum Teaching learning model and those who were taught the *Concept Sentence learning model*, pretest and posttest were carried out in both experimental classes. The results of the *pretest* and *posttest* analysis for experimental class I (*Quantum Teaching*) and experimental class II (*Concept Sentence*) can be seen in table 1.

Table 1. Pretest and posttest analysis for experimental class I (Quantum Teaching) and experimental class II (Concept Sentence).

Statistics	QT pretest	Posttest QT	Pretest CS	Posttest CS
N	34	34	34	34
Lowest Value	27	70	27	53
The highest score	60	93	60	83
Average	39.80	80.59	39.02	68,14
std. Deviation	8,91	7,45	9,62	8,25
Variance	79,42	55,54	92,61	68,14

Furthermore, to find out whether the data is normally distributed or not, a normality test is carried out. The normality test was carried out on the data from the pretest and post-test results of the two samples, namely the pretest-posttest of the experimental group I and the pretest-posttest of the experimental group II. Normality testing was carried out

using the Kolmogorov-Smirnov test. The recapitulation of the data normality test results can be seen in table 2.

Table 2. Recapitulation of Normality Test Results

Class	N	D _{max}	D _{critical}	Conclusion
QT pretest	34	0.130	0.227	Normal
Posttest QT	34	0.120	0.227	Normal
Pretest CS	34	0.175	0.227	Normal
Posttest CS	34	0.145	0.227	Normal

Before conducting hypothesis testing, a homogeneity test was carried out first to find out whether the data in the two groups came from a homogeneous population or not. Homogeneity testing was carried out using the F test. The calculation results show that $F_{count} \leq F_{table} = 0.81 \leq 3.982$, it can be concluded that the two data groups are homogeneous. The recapitulation of homogeneity test results can be seen in table 3.

Table 3. Recapitulation of homogeneity test results

Class	et al	Var.	F _{count}	F _{table}	Conclusion
QT	33	55,54	0.81	3,982	Homogeneous
CS	33	68,14			

The hypothesis test was carried out to find out whether the learning outcomes of students in the experimental group I (*Quantum Teaching*) were significantly different from the learning outcomes of students in the experimental group II (*Concept Sentence*) . Hypothesis testing was carried out through the t test and obtained $t_{count} = 9.025 \geq t_{table} = 1.997$ with a significant level $\alpha = 0.05$ and $dk = 66$ so that t_{count} is in the area of rejection of H_0 , which means that hypothesis H_0 is rejected and hypothesis H_a is accepted . Therefore, there are differences in biology learning outcomes for students who are taught using the *quantum teaching learning model* and those who are taught using *the concept sentence learning model*.

DISCUSSION

In testing the hypothesis the difference between the post-test scores of the experimental class I and experiment II, obtained $t_{count} = 9.025 > t_{table} = 1.997$, then H_0 is rejected and H_a is accepted. This shows that there is a significant difference between the experimental class I (X MIA-2) using the *quantum teaching learning model* and the experimental class II (X MIA-3) using the *concept sentence learning model*. Therefore, there is a significant difference between the biology learning outcomes of students who are taught using the *quantum teaching learning*

model and those who are taught using *the concept sentence learning model*.

There are differences in biology learning outcomes for students who are taught using the *quantum teaching learning model* and those who are taught *the concept sentence learning model* cannot be separated from the stages (syntax) in the implementation of the lesson. In the learning process of *quantum teaching* students are accustomed to learning in a pleasant atmosphere so as to increase student learning interest and ultimately improve student learning outcomes. The *quantum teaching learning model* makes students more enthusiastic in receiving lessons, because students get direct experience of the material they are studying, so that the material will be more memorable and will be stored in long-term memory, which ultimately improves student learning outcomes (Janawi, 2013) .

quantum teaching learning model is a learning model that makes students directly experience problems, find their own answers to problems and move according to the competencies to be achieved. The definition of *quantum teaching* is interactions that convert energy into light (Janawi, 2013) . Thus in learning using this learning model makes students more motivated to learn so as to increase interest in learning which in turn can improve student learning outcomes. This is in accordance with Indayana Febriani Tanjung's research (2018) which concluded that there were differences in learning outcomes before and after learning using *quantum learning learning strategies* (Indayana Febriani Tanjung, 2018) . In addition, the findings of this study support the results of research conducted by Ni Luh Suyantini (2019), which resulted in the conclusion that quantum teaching learning can improve students' natural science learning outcomes (Ni Luh Suyantini, 2018) . The results of other relevant studies were also carried out by Wicaksono and Vahlia (2016), the results of the study showed that the *quantum teaching learning model* had a

positive effect on students' understanding of concepts (Satrio Wicaksono, 2016) .

While the use of the *concept sentence* learning model in this study seeks to teach students to make a sentence with several keywords that have been provided so that they can capture the meaning/concept contained in the sentence and distinguish it from other sentences (Miftahul Huda, 2018) . By understanding student keywords students as a whole can understand the material and lesson objectives so as to increase student learning outcomes.

This is in accordance with research conducted by Jalijah Azizah Lubis and Mhd. Addiansyah Nst who concluded that students' biology learning outcomes could be increased through the application of the *concept sentence* learning method to environmental change material (Jalijah Azizah Lubis, et.al., 2020) . In addition, the findings of this study support the results of research conducted by Lumowa (2015), which concluded that the average learning outcomes of students who were taught using the *concept sentence learning model* 77 ,8 (Sonja V. Lumowa, 2015) . Another relevant research is research conducted by Natalia Wit, et al (2017), the results of the study concluded that learning using the *concept sentence learning model* has moderate effectiveness on students' cognitive learning outcomes (Natalia Wit, et.al., 2017).

concept sentence learning model is able to direct students to better understand keywords from the subject matter, students who are more intelligent can teach students who are less intelligent so that as a whole they can understand the material and learning objectives. However, during the learning process, some students were not actively involved in the discussion and hoped that the group leader or someone who was smarter would look for the information and problems given so that their understanding was lacking. This is what causes the average student score to be lower than that of the experimental class I.

CONCLUSION

Based on the results of the calculation of the hypothesis test with the t test obtained $t_{count} > t_{tab 1} = 9.025 > 1.997$ with a significant level $\alpha = 0.05$ and $dk = 66$. This shows that H_0 is rejected and H_a is accepted, so it can be concluded that there are differences in the learning outcomes of students who are taught using the *quantum teaching learning model* and those who are taught using the *concept sentence learning model*.

Based on the research results and conclusions that have been obtained in this study, the authors propose the following suggestions; for biology teachers, they should make improvements and improvements in learning by using a variety of learning models, including the *quantum teaching* and *concept sentence learning models*, so that the material can be delivered optimally and students don't feel bored. For students, the *quantum teaching* and *concept sentence learning model* can be used as a reference to eliminate student boredom in the biology learning process, especially in ecosystem material so that they can achieve good learning outcomes, and can increase students' attention and role both in asking questions, answering questions and expressing opinions. For schools, schools should be able to direct teachers to use more creative and innovative learning models. For further researchers, it is hoped that there will be further research from this research in order to use the *quantum teaching learning model* and *concept sentences on other appropriate subjects*.

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