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Giving Questions and Getting Answers (GQGA) Strategies to Improve Biology Learning Outcomes

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Abstract

This study was intended to examine the effect of Giving Questions and Getting Answer (GQGA) learning strategy on the students' biology learning outcomes at Al-Falah Islamic High School students in Jambi City. This research adopts a quantitative study using the true experiment design - posttest only control design. The instrument of data collection uses multiple-choice tests and observation sheets. From the data collection that has been obtained, the calculation resulted in the average value of the cognitive domain of the experimental class of 75.38 and the average affective domain of 77.38, while for the control class, the cognitive domain averaged 65.00 and the average affective domain of 71.03. Based on the results of data analysis, it was found that cognitive domain resulted in a value of $t_{count} > t_{table}$ were 2.96 > 2.00 with the effect size 0.8 or 79% (a quite high category), while the affective domain was $t_{count} > t_{table}$ which was 4.81 > 2.00 with the effect size 1.23 or 88% (high category). Based on these data, it shows that there is a significant effect on the use of the GQGA learning strategy on the students' biology learning outcomes. The results of this study suggest teachers apply the GQGA learning strategy in biology learning, especially in the excretory system material.

1. Introduction

Education becomes one of the important elements in developing the nation and the state. It can be shown that the development and progress of all fields are determined by the success of education (Sulistiyo, 2013). Education is needed so that humans can improve their quality and be able to empower the natural and environmental potential for the benefit of their lives. Efforts to improve self-quality through education depend on the learning process. Improving the quality of education can be seen from the learning that takes place at the school (Setiaji & Joko, 2013). Education is one of the important things to determine the progress of a nation, to produce human resources as subjects in better development, capital is needed from the results of education itself (Azis & Amaliah, 2011).

Education in schools must be given well and effectively. Quality education requires educators who have good self-abilities. Educators must be able to create an active, effective, and efficient learning process (Setiawan & Indriwati, 2018). Education is not in accordance

with the demands and needs of students, which causes the low quality of education (Harahap, 2013). Efforts to improve the quality of education, the Indonesian government must make changes both in the form of the education system, which involves the curriculum structure and learning patterns implemented (Marjan et al., 2014).

Learning can be defined as an effort to develop students' activities and creativity (Rifma, 2016). Most of the learning process at school is still in the form of listening and recording teacher explanations (Anisah, 2014). In addition, there are still many students who complain about learning difficulties in participating in learning activities. We often encounter this difficulty when the teaching and learning process takes place, the low student learning outcomes due to the lack of student enthusiasm for learning. In one class, there are only a few students who respond, absorb, and even work on practice questions (Rozi, 2014). Such learning does not build students' understanding of the information and experience gained (Lestari & Romdiani, 2018). The understanding of each student is different, and it can be seen from the results of the evaluation of student learning in the learning process conducted by the teacher.

The role of the teacher in the learning process is not only teaching but also must think of strategies used to explain learning material. The strategy has an important role in the learning process (Effendi & Siregar, 2018). This is because each teacher chooses the right strategy for all material to be delivered, so that the learning process runs well, creates a pleasant learning atmosphere and develops the potential of students so that learning objectives are achieved (Sanjaya, 2015). Learning that is not boring can trigger interactions between students and teachers, as well as between students and students, as well as between students and subject matter (multi-interaction).

Besides, learning is also an effort to develop students' activities and creativity (Rifma, 2016). Ideal learning is learning that is centered on student learning activities. High student learning activities are expected to improve student learning outcomes (Aksiwi & Sagoro, 2014). Most of the learning process at school is still in the form of listening and recording teacher explanations (Anisah, 2014). Such learning does not build students' understanding of the information and experience gained (Lestari & Romdiani, 2018).

The understanding of each student varies. It can be seen from the results of the evaluation of student learning in the learning process conducted by the teacher. The role of the teacher in the learning process is not only teaching but also must think of strategies used to explain

learning material. A teacher who has the right learning strategy, the learning process will run well (Prihatini, 2017). The strategy has an essential role in the learning process (Effendi & Siregar, 2018). This is because each teacher chooses the right approach for all material to be delivered, so that the learning process runs well, creating a pleasant and unsaturated learning atmosphere so that it can spur students to think creatively (Mutiara et al., 2019). Besides that, it can develop the potential of students and improve learning outcomes (Sanjaya, 2015). Improved learning outcomes must pay attention to the integration of teaching strategies and the implementation of learning through various teaching methods (Ahmad et al., 2015), taking into account the nature and content of the subjects being taught and also the context of the implementation of the learning process (Lin et al., 2016).

Based on preliminary observations made on October 25, 2018, at Al-Falah Islamic High School in Jambi City, it is known that there is rarely active interaction between students and teachers and students and other students. The process of learning biology tends to be monotonous, unattractive, and more dominated by teachers. This causes, intelligent students, do not get the opportunity to show their potential during the learning process takes place (Susanti et al., 2017) Students who are shy and are not brave, are only passive when learning takes place. As a result, students are less active in answering questions or asking questions about concepts learned. This problem shows that the learning patterns of students in answering questions rely solely on memorizing the material and not the result of understanding, problem analysis and not the result of thinking in solving the problems faced (Insyasiska et al., 2015)

Furthermore, based on the results of interviews with several students of Al-Falah Islamic High School class XI IPA and Biology subject teachers at Al-Falah Islamic High School, it is known that the problems faced by students as described in the previous paragraph are known to affect learning outcomes are still low greatly. This is evidenced by the data from the results of class XI science students who have not reached the maximum target of learning expected, for the Minimum Completion Criteria (KKM) of biology subjects in the school is 80, with a total of 96 students namely Class XI IPA 1 with an average of 65.44 average, XI IPA 2 with an average of 64.09 and XI IPA 3 with an average of 62.91.

The students get low learning outcomes because they find it challenging to study biology, for example, many terms that are not understood in genetics. Genetics is an abstract and complex branch of biology that is difficult to understand. Based on research by Fauzi and

Fariantika (2018), more than 20% of student responses, both undergraduate and non-educational, reveal that concepts in genetics are challenging to understand. This is because many biologists use Latin as a scientific language that is difficult to memorize. In addition, because learning experiences are textual, and students lack a role in learning. The learning model used is still teacher-centered, which is learning that is centered only in one direction, resulting in activities in the class conducted solely by the teacher and makes students become passive and lazy in learning biology. The use of monotonous learning models is more likely to produce boring teaching and learning activities, and students will look less motivated to learn (Pane, 2016).

The implementation of learning like this has an impact on the low learning outcomes of biology, so the material is felt confusing, and learning outcomes are less than optimal (Erlinda, 2017). Therefore, choosing the right learning strategy can produce more exciting and enjoyable learning. This is done so that students are more active so that the quality of student learning outcomes improves. Active learning can be created using learning strategies. Many learning strategies that can be used in the learning process in class. One of them is the GQGA learning strategy. GQGA learning strategy is one of the active learning strategies that implement constructivist learning strategies that place students as subjects in learning (Silberman, 2007). The GQGA strategy was developed to train students to have the ability and skills to ask and answer because basically, the approach is a modification of the question and explain method and lecture method, which is a collaboration using pieces of paper as the medium. With this learning strategy, students can absorb information faster, and students are confident and brave in submitting opinions and asking questions (Yunus & Ilham, 2013). Based on this explanation, the GQGA learning strategy can help improve student learning outcomes.

Similar research was conducted by Hamida (2016) about active learning strategies of Type GQGA in Physics class XI students of SMAN 1 Gunung Tuleh, West Sumatra shows that GQGA is successful in improving physics learning outcomes measured in cognitive aspects. The results of hypothesis testing with t-test obtained t-count = 3.27> t-table = 2.01, the hypothesis in this study was accepted. The conclusion is that there is an effect of the GQGA learning strategy on the physics learning outcomes of students of class XI of SMAN 1 Gunung Tuleh. This research shows that the GQGA strategy can be used as a solution to improve student learning outcomes in the classroom. Furthermore, research conducted by

Yunus and Ilham (2013) on the Effect of Active Learning Strategy Type Giving Questions and Getting Answers on Learning Outcomes of Class X Students of SMA Negeri 1 Bajeng (Study on the Subject Material Nomenclature Compounding and Equation of Reaction) shows that the learning strategy of GQGA positive effect on student learning outcomes in class X SMA Negeri 1 Bajeng.

Both studies show that the use of the GQGA learning strategy can have a positive effect and improve student learning outcomes at school. Based on the superiority of the GQGA learning strategy and the success of previous studies, the researcher wants to try to do similar research as a solution to the problems found in the Al-Falah Islamic High School in Jambi City. This study aims to determine the effect of the GQGA learning strategy on learning outcomes in biology at Al-Falah Islamic High School in Jambi City. Biology learning outcomes include cognitive and affective domains.

2. Methods

This research is a type of quantitative analysis with experimental methods. The research design used in this study is Posttest-Only Control Design. The variables studied in this study are independent variables (dependent) and dependent variables (dependent). The independent variable in this study is the GQGA strategy in the experimental class, while the dependent variable is the results of learning biology achieved by students. The steps of the Giving Questions and Getting Answer (GQGA) learning strategy are as follows (Silberman, 2007).

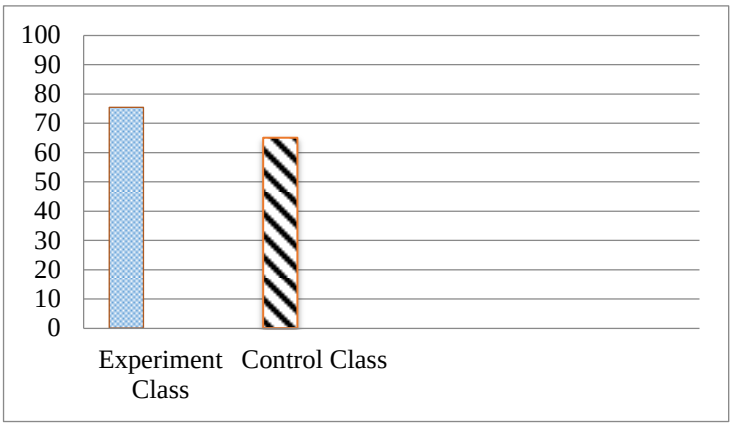
1) Give two index cards to each student;
2) Ask each student to complete the following sentence:
   Card 1: I still have questions about ....
   Card 2: I can answer questions about ....
3) Create sub-groups and ask each group to choose the most appropriate "question to ask," and the most "question to answer" from the group member cards.
4) Each student who will ask questions must submit card number 1, and students who will answer questions must provide card number 2.
5) If up to the end of the session, there are students who still have two or one pieces of paper that are question paper or answer essay, then students are asked to make a resume about the learning material that day.

The population in this study were students of gare XI Science of Islamic High School Al-Falah, Jambi City. For sampling techniques using random cluster sampling, so XI Science 3 was chosen as the experimental class and XI Science 2 as the control class.

Data analysis techniques used normality tests using Liliefors, homogeneity using homogeneous variance tests, and hypothesis testing with independent t-test formulas. Data collection techniques used in this study were tests in the form of multiple-choice questions and observation sheets. MCQs are used to measure learning outcomes in the cognitive domain. Multiple choice questions totaling 25 numbers with five answer choices in the excretion and reliability system material 0.8059> 0.3388. The first indicator is represented by seven questions, the second indicator is six questions, the third indicator is six questions, and the fourth indicator is six questions. Score one if the answer is correct and score zero if the answer is wrong or not answered. Observation sheets are used to measure affective domain learning outcomes. Observation sheet totaling 15 items. There are three useful assessment indicators, namely cooperation represented by five questions, self-confidence indicators five questions, and tolerance indicators five items. Posttest data from control and experimental classes were collected and then analyzed.

3. Results and Discussion

The research data are in the form of posttest scores of biology learning outcomes in the cognitive and affective domains. Posttest data were analyzed by t-test to determine the effect of the GQGA strategy on biology learning outcomes. Cognitive learning outcomes obtained in the form of objective questions given to students after learning takes place. The test questions used have been tested for validity, reliability, level of difficulty, and the difference in power. Based on the post-test given, the average test results obtained by the experimental class students were 75.38. Whereas in the control class, the average test results are 65.00. The results obtained were then tested for normality, and the homogeneity test was further tested using a t-test. Further tests using the t-test post-test value aim to test the research hypothesis obtained that tcount> t-table is 2.96> 2.00 so that the alternative hypothesis is accepted for post-test learning outcomes. A comparison between the experimental class and the control class can be seen in the average cognitive domain learning outcomes in Graph 1.



Graph 1. The Average Score of Cognitive Domain Learning Outcomes in Experimental and Control Classes

The results of the statistical analysis show that there is a positive effect of the GQGA learning strategy on the cognitive domain of biology learning outcomes. The detail is presented in table 1. Table 1. shows that the value of *t* is 2.96, and the amount of *t*-table is 2.00 for a significant level of 5%. From the t-count data, cognitive learning outcomes are higher than the table. Based on the results of the table, the H1 test decision is accepted because there are differences in the acquisition of cognitive values between the experimental class and the control class. From these differences then, GQGA affects the learning outcomes of biology in the cognitive domain with an effect size of 0.8 or 79% with a high enough category.

Table 1. Hypothesis Test Results of the effect of the GQGA strategy on the cognitive domain of biology learning outcomes

Variable	**t_{count}**	**d (*effect size*)**	**df**	**Result**
Cognitive Domain Learning Outcomes	2.96	0.8	62	H_1accepted

Based on the hypothesis test stated that the average value of cognitive learning outcomes of students shows that the GQGA strategy is better than conventional learning strategies with lectures or discussions. The great learning outcomes of the experimental class are caused by the GQGA strategy that can increase student interest and activity in learning. The procedure requires students to be more active in understanding the subject matter. So, the learning process using this GQGA strategy will make students active, independent, and students are given the opportunity to ask questions and express opinions through paper media, so students are encouraged to be more courageous to express their questions and views. Through these questions and answers, students can help improve learning outcomes and the quality of the learning process. GQGA strategies can inspire learning, and students feel closer to their peers

and the emergence of an atmosphere that is not rigid in learning (Megayani & Khulaelaturroihah, 2017). Besides, student activity tends to increase; this is seen from the enthusiasm of students in asking and giving responses to the activity of learning the impact on student learning outcomes for the better. The GQGA strategy also stimulates students to train and develop thinking power, including student memory (Djamarah & Zain, 2006).

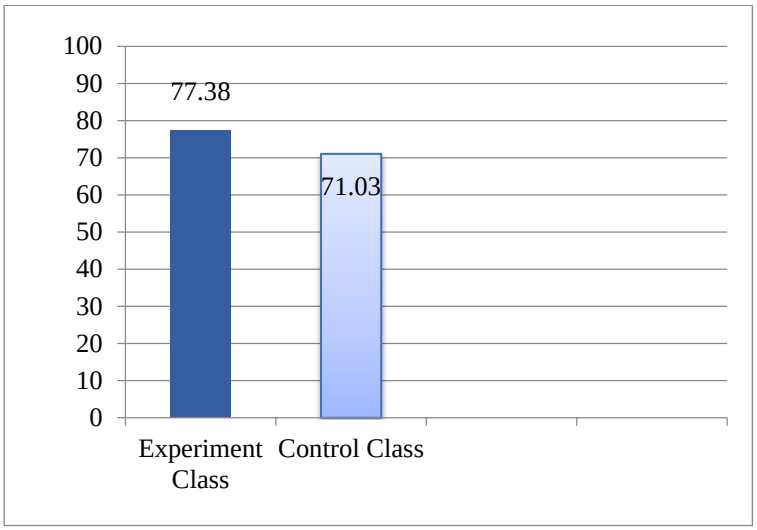
Hamida (2016) also confirmed that learning outcomes with the application of the GQGA strategy would be more interesting because students are more excited and motivated in learning activities. This can be seen from the activeness of students in raising questions or expressing ideas and responding to their friends' opinions in learning activities by reading questions and answers through the paper provided (Chasanah et al., 2012). Questions and answers written on question cards and answer cards help students remember and formulate questions carefully and precisely (Suryanti, 2013).

In the control class, student learning outcomes using conventional methods (lectures) are lower than learning using the GQGA strategy. This is because, in the control class, the learning process takes place by the way the teacher explains the material in a lecture. According to Djamarah & Zain (2015), the lack of a lecture method that is learning activities becomes verbalism (understanding words), so the teacher does not know the various types of student learning. The lecture method can cause students to become bored — lack of control about students' understanding of the material taught by the teacher. Teachers tend to be authoritarian and make students dependent on their teachers.

These differences indicate that the application of the GQGA strategy affects students' cognitive abilities very well and positively. The positive influence in question is the increase in students' cognitive skills after participating in learning activities using these strategies. The improvement is inseparable from the impact that occurs on students after learning that is active students, trains students 'memory about concepts or information, trains students' thinking power towards a problem, and provides innovative learning experiences to students.

Affective domain learning outcomes are obtained through an observation sheet in the form of an assessment from an observer. Affective domain learning outcomes achieved by the experimental class is 77.38, while the control class has an average of 71.03. The results were also tested for normality and homogeneity, which were further tested for the hypothesis by using the t-test. Based on the results obtained from the hypothesis test found the tcount> t-

table is 4.81> 2.00. The comparison between the experimental class and the control class can be seen in the average affective domain learning outcomes in Graph 2.



Graph 2. The Average Score of Affective Domain Learning Outcomes in Experimental and Control Classes

The results of the statistical analysis show that there is a positive effect of the GQGA learning strategy on the affective domain of biology learning outcomes. The detail is presented in Table 2. Table 2 shows that the calculated value is 4.81, and the table value is 2.00 for a significant level of 5%. From the data t count, affective learning outcomes are higher than the table. Based on the results of the table, the H1 test decision is accepted because there are differences in the acquisition of affective values between the experimental class and the control class. From these differences, GQGA affects the learning outcomes of biology in the affective domain with an effect size of 1.23 or 88% with a high category.

Based on the hypothesis test stated that the average value of student biology learning outcomes in the affective domain of the experimental class is better than the control class. Because this GQGA learning strategy can build functional interactions between teachers and students, students follow the learning process well. The GQGA learning strategy also helps students become more active and focused on the learning process so that students do not get bored and sleepy because students are given the opportunity to write questions and express ideas on paper and discuss with their friends. This strategy also has a positive effect on student attitudes, one of which is that students value differences of opinion with their friends and are confident when expressing their opinions or asking questions (Yunus & Ilham, 2013).

Table 2. Hypothesis Test Results of the effect of the GQGA learning strategy on the affective domain of biology learning outcomes

Variable	t_{count}	d (*effect size*)	df	Result
Affective Domain Learning Outcomes	4.81	1.23	62	Hypothesis alternative is accepted

Through implementing the GQGA strategy, students can organize ideas to understand the material in their respective groups so that students are expected to be able to behave better. Lie (2014) states that affective students with the high academic ability also need to train themselves to be able to work together in social life. Thus, improving affective aspects is very important. The application of the GQGA learning strategy can improve the affective of students when learning as expressed by (Sudijono, 2011) that the characteristics of effective learning outcomes will appear to students in a variety of behaviors, such as attention to subjects, discipline in following subjects, motivation high to know more about the lesson.

This scientific-based GQGA strategy exchanges information through discussions. According to Lie (2014), one of the strengths of groups is to increase participation and easier interaction. In the process, students work together in an atmosphere of mutual cooperation and communication with each other, so that student participation is encouraged in the learning process. In addition, the GQGA Strategy can increase students' courage in expressing opinions or questions (Sudirman, 2015). In this case, the researcher uses the observation sheet to assess the affective aspects of students through observers conducted in the experimental class and the control class.

4. Conclusion

Based on the results of data analysis and discussion, it can be concluded that GQGA has a positive effect on the learning outcomes of students of the Al-Falah Islamic High School in Jambi City on cognitive and affective aspects. The following are details of data analysis and research hypothesis testing. From the results of the research that has been obtained, the authors propose the following suggestions: 1) Learning with the Giving Questions and Getting Answer (GQGA) strategy can be one of the alternative strategies to biological learning, 2) This research is only carried out on the material of the Excretion System with Giving Questions and Getting Answer (GQGA) strategies. It is expected that in subsequent studies, similar research can be carried out on different materials, and measure other aspects/domain or different levels of school.

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