

Memorization and discussion methods effect on achievement and communication skills

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Article Info

Article history:

Received Feb 28, 2023

Revised Aug 18, 2023

Accepted Sep 20, 2023

Keywords:

Achievement

Combination methods

Communication skill

Discussion

Memorization

ABSTRACT

This study aimed to determine learning outcomes and discuss the effect of the combination of memorization and small group discussion methods on students' achievement and communication skills. A quantitative method was applied in this study with a quasi-experimental design. The subject of this study is 60 students in Islamic Education, Faculty of Education and Teacher Training (FTIK) at the Pontianak State Institute for Islamic Studies, divided into a control and an experimental group. Data were collected through pre-test and post-test from the control and experimental groups and then analyzed using the independent samples t-test using statistical software JASP version 0.16.4. The findings revealed that there are differences between outcome learning and communication skills between the control group which only uses the small group discussion method and the experimental group which employs a combination of memorization and small group discussion methods in the course of developing Islamic Education material. The findings of this study confirm that combining the two methods, memorization, and small group discussion, is highly effective in improving learning achievement and communication skills at the student level. Further research is suggested to explore and determine other factors affecting learning outcomes and methods.

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1. INTRODUCTION

Higher education plays an important role in shaping the intelligence and skills of students [1]. These skills serve as an indicator of the quality of education provided by an institution [2]. Moreover, the learning outcomes can be useful in preparing students to enter the workforce and can improve an individual's social status in society [3]. Learning outcomes in higher education are not only determined by students' abilities to comprehend the material but also by the learning methods used [4], [5]. Therefore, the learning methods employed have a significant impact on improving students' learning outcomes and communication skills.

Learning methods refer to the techniques or ways in which educational material is delivered to students. Learning methods play a crucial role in enhancing the effectiveness and efficiency of the learning process [6]. The right learning methods can help to increase students' motivation and participation in the learning process. One role of learning methods is to activate students in the learning process. Active and creative learning methods can help to generate students' interest and desire to learn the subject matter. According to Xiao *et al.* [7], active learning can help to increase students' motivation and participation in the learning process. Furthermore, learning methods can also help to improve the quality and quantity of students'

learning outcomes [8]. The right learning methods can help to enhance student's understanding and learning experiences, which can impact their learning outcomes. Learning methods can also help to develop student's social skills and critical thinking skills [9]. Moreover, using project-based or problem-based learning methods can help students develop teamwork skills, creativity, and innovation. Varied and innovative learning methods can help to enhance the quality and effectiveness of teaching [10].

Choosing the right learning method is a key factor in enhancing the effectiveness of learning. Several strategies can be used to choose the right learning method, such as aligning it with learning objectives, identifying student characteristics, adapting to the material being taught, assessing the learning environment, and combining various learning methods [11]. In the last few decades, the memorization method has been frequently used in learning [12]. The memorization method requires students to memorize the subject matter without understanding its meaning. Rote learning is a learning method that involves memorizing facts or information repeatedly without a deep understanding of the material. This theory is based on the idea that the human brain can remember information well through repetition and training

The memorization method is often used in formal education, especially when learning foreign languages, mathematics, or science. The history of the development of Islamic religious knowledge began with the application of memorizing the holy book of the Quran [13]. Specifically, in Islamic Education courses, the memorization method is still very effective, especially for materials that are based on verses or hadiths. However, this method has limitations in facilitating understanding and the application of knowledge outside the context of memorization [14]. Nevertheless, the memorization method can be useful in some situations, especially in strengthening short-term memory. According to research, intense repetition can increase a person's memorization capacity and recall [15], [16].

This method is widely used because it is considered effective in improving students' ability to remember information [17]. The memorization method is a learning method that is usually used to memorize certain materials or concepts in a short time. This method tends to focus on the cognitive aspect of learning, such as quickly remembering information or facts [18]. However, the memorization method also has weaknesses, such as being less effective in understanding the concepts behind the information, increasing the risk of forgetting, and being less effective in problem-solving.

Another variable in this study is the use of the small group discussion method combined with the memorization method. Small group discussion (SGD) is a learning method that involves discussion among several people to understand a topic or solve a problem together [19]. The theory of SGD is based on social cognitive theory, where individuals learn through social interaction with others and through observation, imitation, and reflection on shared experiences. Small group discussions can facilitate collaborative learning and positive social interaction among students [20]. Small group discussion can also strengthen cognitive skills such as problem-solving, critical thinking, and analysis, as well as improve social skills such as cooperation and communication [21].

Several previous studies have been conducted to identify the influence of the use of memorization and small-group discussion methods on student learning outcomes and communication skills. The study was conducted by showed that the use of the small group discussion method can improve student learning outcomes and communication skills more effectively than the memorization method. Another study conducted, also showed similar results, that the use of the small group discussion method can help students understand the material better and improve their communication skills. Other research shows that small group discussion is more effective in improving student learning outcomes and communication skills than the memorization method, as found by previous researchers [22] who found that small group discussion significantly improves student learning outcomes compared to the memorization method. Similarly, the study conducted showed that small-group discussion significantly contributes to improving communication skills. Branch and Kopcha [23] stated that "the use of the memorization method tends to only force students to remember information, without allowing them to understand and apply the concepts they have learned." This can lead to a lack of motivation and interest in learning, which negatively impacts learning achievement.

However, other studies have shown different results. While a study suggested that the use of rote memorization still had a significant impact on improving student learning outcomes [24]. However, this study did not consider the influence on communication skills. In addition, similar studies have also shown that rote memorization is still effective in improving learning achievement in certain learning contexts. Therefore, a more detailed study is needed to identify the effect of rote memorization and small group discussion on student learning outcomes and communication skills. This study can provide new insights for educational practitioners and students about the benefits and weaknesses of each learning method and how their use can help students achieve better learning outcomes and more effective communication skills. The novelty of this study lies in evaluating the effect of the combination of rote memorization and small group discussion on student learning outcomes and communication skills in a university setting, even though previous studies have evaluated the effect of both methods separately.

This study aims to determine the influence of the use of the combination of rote memorization and small group discussion on student learning outcomes and communication skills. This research is expected to provide useful information for educators in choosing the appropriate learning method to improve learning outcomes and communication skills. Based on the research background, the research problem is: "Is there an effect of using a combination of rote memorization methods and small group discussions on student learning outcomes and communication skills?" Therefore, this study tries to provide a solution by testing a combination of memorization methods and small group discussions as an alternative solution to improve learning outcomes and an alternative to closing the research gap in question; this solution is in the form of a new method of learning that can be applied by teachers.

2. RESEARCH METHOD

We used a quasi-experimental design with control and experimental groups [25], and a comparative quantitative research method to test the hypothesis of the comparison of learning outcomes and skills of students before and after using the rote learning and focused small group discussion methods on the subject of Islamic Religious Education at the intermediate level. In support of the methodology described, we involved many respondents in this study. According to the Central Limit Theorem, it takes at least 30 respondents to produce data close to a normal distribution. However, we have involved 60 students in this study, double the minimum number. The Central Limit Theorem requires a minimum of 30 respondents, but this study had 60 students as participants. Therefore, the resulting data is expected to be close to a normal distribution, enabling parametric and non-parametric statistical analysis with excellent reliability and statistical power. Islam [26] opinion is, "With a sample size of more than 30, we can feel more confident that the sample distribution will be close to normal, enabling parametric and non-parametric analyses to be more reliable and valid." Relevant to Thisted [27] that, "as a general rule, if the sample size exceeds 30, the spread of the sample means and sample proportions will approach a normal distribution, regardless of the shape of the population distribution."

2.1. Respondent

The research respondent was 60 (22 male and 38 female) undergraduate students at the Pontianak State Institute for Islamic Studies the sampling technique used was purposive sampling. The inclusion criteria were undergraduate students majoring in Islamic Religious Education who participated in learning on the subject of Islamic Religious Education at the intermediate level, while the exclusion criteria were undergraduate students in the Islamic religious education program who had not attended lectures on the subject of Islamic religious education at the intermediate level using the combination of rote learning and small group discussion method or students in other study programs.

2.2. Data analysis

We used a two-sample independent t-test [28] to test the hypothesis of the comparison of learning outcomes and skills of students before and after the implementation of the memorization method and focus group discussions. Before conducting the hypothesis test using a two-sample independent t-test, we first check for normality assumption and the homogeneity of variances. If the data did not meet the normality assumption, we would use an alternative method from the non-parametric statistical method, namely the Mann-Whitney test [29]. The tool used in the process of analyzing this research data is the open-source statistical software JASP version 0.16.4.

3. RESULTS AND DISCUSSION

In this section, the results and discussion are discussed. The discussion begins with the normality test and the homogeneity of the instrument because it is a test requirement t. Because the requirements are not met, the data analysis switches to using the Mann-Whitney U Test, then continues with the hypothesis test. In the discussion section, the acquisition of student experimental results and their significance was discussed, as well as theoretical discussions with previous literature.

3.1. Normality test

The two-independent sample t-test, which compares the means of two independent sample groups, is a parametric statistical test and therefore requires normality of data assumption. The normality test in this study was performed using the Shapiro-Wilk test [30]. The normality criteria of data were based on the threshold value of the significance probability (P); if the significance value $> \alpha$ ($\alpha=0.05$), then H_0 is accepted, meaning that the data are normally distributed, and conversely, if the significance probability < 0.05 , then H_0 is rejected, meaning that the data are not normally distributed. In this study, a normality test was conducted using an open-

source software package, namely JASP 0.16.4. A summary of the normality test results using the R program is presented in Table 1.

Based on Table 1, it can be seen that the Shapiro-Wilk statistic for the student's learning outcomes is 0.960 with a probability of 0.001, and since $P < 0.05$, H_0 is rejected, meaning that the student's learning outcomes do not follow a normal distribution. Similarly, for the students' skill scores, the Shapiro-Wilk statistic is 0.922 with a probability of < 0.001 , and since $P < 0.05$, H_0 is rejected, meaning that the student's skill scores do not follow a normal distribution. The normality assumption, which is a primary requirement in parametric statistical analysis (two independent sample t-tests), is not met. Therefore, we used an alternative analysis using non-parametric statistics, namely the Mann-Whitney test.

3.2. Homogeneity test

The two-independent sample t-test is a test for comparing the similarity of means between two independent sample groups, with the assumption that the variances of the two sample groups are homogenous (equal). However, the two independent sample t-tests can also be used for data with heterogeneous variances (unequal). In this study, the equality of variances was tested using Levene's test. The homogeneity criteria of data were based on the threshold value of the significance probability (P); if the significance value $> \alpha$ ($\alpha = 0.05$), then H_0 is accepted, meaning that the data variances are homogeneous, and conversely, if the significance probability < 0.05 , then H_0 is rejected, meaning that the data variances are heterogeneous (non-homogeneous). The result of the homogeneity of variance test using JASP software is presented in Table 2

	W	P
Learning outcomes	0.960	0.001
A score of communication skill	0.922	$< .001$

	F	df	df2	P
Learning outcomes	6.091	1	118	0.015
A score of communication skill	0.271	1	118	0.604

Based on Table 2, the F statistic value for students' learning outcomes is 6.091 with a significant probability of 0.015. Since $P < 0.05$, H_0 is rejected, meaning that the variance of the learning outcomes data is not homogeneous (heterogeneous). On the other hand, the score of students' skills obtained an F statistic value of 0.271 with a significant probability of 0.604. Since $P > 0.05$, H_0 is accepted, meaning that the variance of the students' skill scores is homogeneous. Statistically, although the data for learning outcomes did not meet the assumption of homogeneity of variances, the Mann-Whitney test can still be conducted to test the hypothesis of the effect of rote learning and small group discussions on the learning outcomes and communication skills of Islamic Education students in the subject of Middle School Islamic Education.

3.3. Hypothesis testing

The Mann-Whitney U test, also known as the Wilcoxon Rank Sum test, is a nonparametric statistic used as an alternative test when the data do not meet the assumption of normality [31], [32]. This test is used to compare the significance level of the median differences of two unrelated (uncorrelated) sample groups. The results of the comparison test (Mann-Whitney Test) for students' learning outcomes and skills before and after the application of rote learning and focused group discussions using JASP software are presented in Table 3.

		Statistic	df	P	Mean difference	SE difference		Effect size
Learning outcome	Welch's t	-3.71	104	< 0.001	-0.117	0.0315	Cohen's d	-0.678
	Mann-Whitney U	1258		0.004	-0.0892		Rank biserial correlation	0.301
Communication skill score	Welch's t	-2.61	118	0.010	-1.033	0.3961	Cohen's d	-0.476
	Mann-Whitney U	1327		0.010	-1.0000		Rank biserial correlation	0.263

Based on statistical hypothesis testing using the Mann-Whitney test in Table 3, two statistical measures were obtained, namely; Welch's t for data that did not meet the assumption of variance homogeneity, and the Mann-Whitney U statistic for data that met the assumption of variance homogeneity. Referring to Table 2, the students' learning outcomes did not meet the assumption of variance homogeneity, so we will assess Welch's t statistic [33]. The Welch's t statistic value is -3.71 with $P < 0.001$, because $P < 0.05$ then H_0 is rejected, meaning that there is a significant difference between students' learning outcomes before and after implementing the memorization and focused group discussion method. The effect size value supports the

hypothesis test, showing the standardized difference between the experimental group and the control group's learning outcomes. The effect size in learning outcomes is -0.678 according to Cohen's criteria, which is considered to have a large effect size [34], in other words, the memorization and focused group learning methods significantly improve students' learning outcomes in the subject of Islamic Education at the intermediate level.

Furthermore, based on Table 3, the Mann-Whitney statistic value is 2.61 with a probability significance of 0.01. Because $P < 0.05$, H_0 is rejected, meaning that there is a difference in student skills before and after applying the memorization and focused group discussion method. This hypothesis decision is also supported by the positive Rank Biserial correlation coefficient of 0.263, meaning that the use of the memorization and focused group discussion method is significantly linearly related to the improvement of students' communication skills.

The group descriptives in Table 4 depict the mean and median of students' learning outcomes and skill scores before and after applying the memorization and focused group discussion method. The control group shows the learning outcomes and skill scores before applying the method, while the experimental group shows the learning outcomes and skill scores after applying the method. The median value indicates that both the learning outcomes and skill scores of students before applying the memorization and focused group discussion method were lower compared to the learning outcomes and skill scores of students after applying the method. To strengthen the information obtained from Table 4, we present plots (graphs) of students' learning outcomes and skills before and after applying the memorization and focused group discussion method in Figures 1 and 2.

Table 4. Group descriptives

	Group	N	Mean	Median	SD	SE
Learning outcomes	Control	60	0.247	0.300	0.202	0.0261
	Experimental	60	0.364	0.333	0.137	0.0177
Communication skill score	Control	60	23.217	23.000	2.148	0.2773
	Experiment	60	24.250	24.000	2.191	0.2829

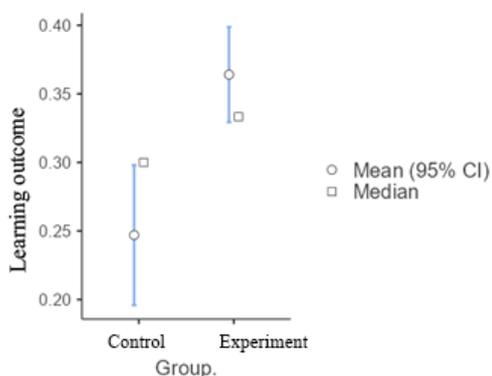


Figure 1. The plot of student learning outcomes before and after applying the memorization and focused group discussion methods

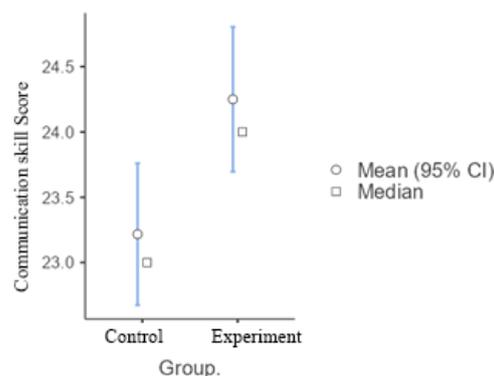


Figure 2. Student skill plot before and after applying memorization and focused group discussion methods

Visually, Figure 1 clearly shows that the gained score of student learning outcomes in the experimental group ranged from 0.32 to 0.4, while the gained score of student learning outcomes in the control group ranged from 0.2 to 0.3. This strengthens the results of the hypothesis test in Table 3 and the descriptive statistics in Table 4, indicating that the memorization and focused group discussion methods can improve the median student learning outcomes.

In Figure 2, it can be seen that the student's skill scores in the experimental group had gained scores ranging from around 23.6 to 25, while the control group's skill gained scores were in the range of 22.5 to 23.7. This strengthens the hypothesis test results in Table 3 and the descriptive statistics in Table 4, that the memorization and focused group discussion method can improve the median score of students' skills. There was a significant difference between students' learning outcomes before and after implementing the memorization and small group discussion methods. The effect size value supports the hypothesis test, indicating a standardized difference between the experimental and control groups' learning outcomes. The effect size of the learning outcomes is considered to have a strong influence, meaning that the memorization

and focused learning group methods have a significant effect on improving students' learning outcomes in Islamic Education material. The t-test analysis shows that the memorization method is highly effective in strengthening memory for Islamic religious material related to Quranic verses or Hadith texts. This is based on the fact that during the final semester exam, the teacher provided reasoning questions on a particular theme, and students who were given the memorization method could make arguments supported by relevant verses and hadiths, resulting in maximum results. Meanwhile, the control group, which only used presentations and discussions, was mostly only able to argue but was not supported by evidence from the Quranic verses or hadiths.

Based on the explanation, the memorization method is still appropriate to use, especially in Islamic Education subjects that contain evidence from Quranic texts or hadiths, such as the research conducted by Rusyadi and Muassomah [35], which found that the use of memorization methods can improve students' learning outcomes in Fiqh. The results showed that the average score of students who used memorization methods was higher than the control group who did not use the memorization method. The use of memorization methods can improve students' learning outcomes in history. The results showed that the average score of students who used memorization methods was higher than the control group who did not use the memorization method. Therefore, this research can refute some arguments stating that the memorization method does not support critical thinking skills for students. Instead, this research shows that the combination of the memorization and discussion methods is effective in improving both learning outcomes and communication skills. Therefore, to improve students' learning achievements, a combination of two methods, memorization and small group discussion, is needed.

There is a difference in the quality of communication skills among students before and after the application of a combination of memorization and focused group discussions in the experimental class. The combined use of memorization and focused group discussions is linearly related to the improvement of student skills. The median values indicate that both learning outcomes and student skills before the application of the memorization and focused group discussion methods are lower compared to the learning outcomes and skill scores of students after the application of the methods. The difference in learning outcomes between the control and experimental classes is influenced by the combination of the two methods, namely memorization and small group discussions. Communication skills improve as students deliver material supported by memorizing verses or hadiths on each topic discussed in class.

The success of learning as shown in the data is not separate from the accuracy of adjusting the learning method to the learning objectives [36]. The chosen method must be able to achieve the learning objectives effectively [37]. In addition, the material has its characteristics and uniqueness, so choosing the appropriate method can help improve student understanding. For example, more abstract material such as mathematical concepts may require more visual and interactive learning methods [38]. Then, the learning environment such as the classroom space, the number of students, and the available equipment can also affect the choice of learning method. Adjusting the method to the learning environment can help ensure that the selected method is effective in a certain context. Educators' creativity is crucial in teaching, such as combining various teaching methods can help improve learning effectiveness [39]. Prasetyono *et al.* [36] also emphasized that to implement the curriculum (K-13), educators must be creative in using various methods. Therefore, combining different teaching methods can help improve students' understanding and encourage active participation in the learning process [40]. Other research results also state that to improve good argumentation skills in students, educators need creativity in using discussion methods [41].

Therefore, choosing the appropriate learning methods can help improve students' communication skills. Methods that involve discussion and interaction among students, such as small group discussions and presenting team projects, can help students communicate well and effectively. In addition, methods that emphasize argumentation and defending ideas, such as debates and essay writing, can help improve students' ability to express their opinions clearly and persuasively [42]. Through the selection of appropriate learning methods, learning objectives related to both knowledge and skills can be achieved more effectively and efficiently [43]. This study is truly surprising because what is considered most effective in stimulating communication skills is usually just discussion or problem-based learning (PBL) [44]. Previous studies have shown that small group discussions are very effective in improving student skills in clarifying arguments, defending positions, and answering questions [45], [46]. However, this study provides new information that quality communication skills on specific issues, when supported by the ability to recite verses as a basis for arguments presented in a discussion or seminar forum, can also be effective.

The results of this study provide a new variant, in addition to supporting cognitive learning theory which states that learning involves mental processes such as attention, memory, perception, and problem-solving. Cognitive learning theory also emphasizes the importance of previous learning experiences, prior knowledge, and motivation in learning. By using a combination of learning experiences, student learning improves and affects learning outcomes in both knowledge and skills.

4. CONCLUSION

The selection of teaching methods is one of the determining factors in the success of student learning. Similarly, the study of fifth-semester students in the Islamic Religious Education program has proven that there is a significant difference between the learning outcomes of students before and after applying the memorization and small group discussion methods in the control and experimental classes. The effect size value supports the hypothesis test, indicating a standardized difference between the learning outcomes of the experimental group and the control group. Based on Cohen's criteria, the effect size is classified as having a strong influence of -0.678. In other words, memorization and small group discussion methods have a significant impact on improving student learning outcomes in Middle School Islamic Religious Education material.

There is a difference in students' skills before and after the application of the memorization and small group discussion methods. The use of memorization and small group discussions is linearly related to the improvement of students' communication skills. The median value shows that both the learning outcomes and communication skill scores of students before applying the combination of memorization and small group discussions are lower than those of students after applying the methods. Therefore, choosing the right combination of two or more methods can improve students' learning achievement and communication quality in learning.

ACKNOWLEDGMENTS

We would like to express our thanks and gratitude to all parties who have contributed to this study, especially to the students who volunteered and contributed to the completion of the research questionnaires.

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