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ANALYSIS STUDY: THE ABILITY OF LITERATION OF ISLAMIC RELIGIOUS EDUCATION STUDENTS REVIEWED FROM IMPLEMENTING GROUP INVESTIGATION MODEL AND LEARNING MOTIVATION

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Abstract- This study aims to analyze the scientific literacy abilities of students' Islamic Religious Education learning in terms of the implementation of the group investigation model and the motivation to learn Islamic education. This research is a quasi experimental study with a 2 x 2 factorial design. The study was conducted on student learning in the Islamic Religious Education (PAI) program. The sampling technique used convenience sampling with class A as the experimental class and class B as the control class. Data analysis test used two-way ANOVA with SPSS. The results showed (1) there was a significant effect of the group investigation model on students' scientific literacy abilities as indicated by the Sig. less than 0.05 (0.001 <0.05); (2) there is an effect of learning motivation on the scientific literacy skills of students' Islamic Religious Education learning as indicated by the Sig. learning motivation is less than 0.05 (0.000 <0.05); (3) there was an interaction between the group investigation model and learning motivation on the scientific literacy ability of students' Islamic Religious Education as indicated by the Sig. learning model * motivation is less than 0.05 (0.022 <0.05). Students' scientific literacy abilities were influenced by the implementation of the group investigation model and learning motivation.

Keywords: **Scientific literacy skills, group investigation model, motivation, Islamic Religious Education learning**

I. INTRODUCTION

Scientific literacy is an essential ability to empower oneself (National Research Council, 1996) which is very important for students in the 21st century (Liu, 2009; Arohman, Saefudin, & Priyandoko, 2016), in order to be competitive in the competition in the era of globalization (Turiman, Omar, Daud, & Osman, 2012). Scientific literacy is closely related to the ability to explain scientific phenomena, design and evaluate scientific investigations, and interpret scientific data and facts (Gormally, Peggy, & Mary, 2012; OECD, 2016), in an effort to solve scientific problems based on scientific evidence (Bybee, McCrae, & Laurie, 2009; Gormally, Peggy, & Mary, 2012; OECD, 2014).

Individuals who have scientific literacy will be able to use scientific concepts in making daily decisions (Shwartz, Ben-Zvi, & Hofstein, 2006; Bybee, McCrae, & Laurie, 2009; Holbrook & Rannikmae, 2009), can understand the environment, health, economics, and other problems faced by modern society (Bybee, & McCrae, 2011; OECD, 2014), because there are four important aspects that are useful for life, namely content, context, competence, and scientific attitudes (OECD, 2007; Wiliam, 2010). The ability of scientific literacy is not only related to the ability in aspects of scientific knowledge, but also to aspects of attitudes in everyday life.

The ranking of literacy achievements of students in Indonesia is still very low when compared to other countries (Shi, He, Wang, Fan, & Guo, 2016; Kristyowati & Purwanto, 2019). The results of the Program for International Student Assessment (PISA) assessment for Indonesian students' science abilities stated that in 2000 it was graded 38th from of 41 participating nations, in 2003 it was graded 38th from of 40 participating countries, in 2006 it was ranked 50th out of 56 participating countries, in 2009 it was ranked 60th out of 65 participating countries, in 2012 it was graded 64th out of 65 participating countries, in 2015 it was graded 62th out of 69 participating states (OECD, 2018b; Hewi & Shaleh, 2020), and in 2018 it was ranked 71 out of 79 participating countries (Schleicher, 2018; Hewi & Shaleh, 2020). The low scientific literacy of learners and students (prospective teachers) will affect the low understanding of science and students' science learning outcomes (Sujana, Permanasari, Sopandi, & Mudzakir, 2014).

The low scientific literacy is due to learning patterns in schools (including in universities) which still emphasize mastery of concepts (Surpless, Bushey, & Halx , 2014), the teacher centered learning process with conventional learning models that make students passive (Rahayu, Widiyatmoko, & Hartono, 2015; Kristyowati & Purwanto, 2019). Therefore, teachers are the spearhead of education in schools (Udompong, Traiwichitkhun, & Wongwanich, 2014) and one of the main determinants of learning success

(Sujana, Permanasari, Sopandi, & Mudzakir, 2014; Rohman, Rusilowati, & Sulhadi, 2017) as well as the success of student scientific literacy (Gentles, 2018; Juhji & Nuangchalerm, 2020), teachers must have better scientific literacy skills and be able to manage more meaningful learning (Sujana, Permanasari, Sopandi, & Mudzakir, 2014). An effective and fun science learning process must be student-centered, where students actively take part in the learning process (Suhartono, Degeng, Suyitno, & Sulton, 2019).

Improving the quality of student scientific literacy must be carried out by emphasizing learning on inquiry, experiment and problem solving skills (Adolphus, Telima, & Arokoyu, 2012) and the application of an applicable learning model, so that students have knowledge and experience after studying a learning material (Parmin, 2012). One of the appropriate learning models to improve students' scientific literacy skills is the group investigation model.

The group investigation model is a cooperative learning model that places students into heterogeneous groups to carry out investigations into a topic or problem, inquiry, and group discussions (Sharan & Sharan, 1992; Slavin, 2005, 2015). The group investigation model provided an opportunity for students to work together and help each other in studying the subject matter (Johnson, Johnson, & Smith, 2013; Slavin, 2015). Through investigation, students can gain knowledge through experience (Odom & Bell, 2011), can increase student active participation, interaction, decision making, logical thinking, critical thinking, and communication skills between students and teachers (Siddiqui, 2013), and can improve scientific literacy, understanding of scientific processes, and understanding student science knowledge (Hopkins & Smith, 2011). Learning by Model group investigation is an effective learning model in realizing good learning outcomes, especially in improving concept understanding (Suhartono, Degeng, Suyitno, & Sulton, 2019).

The group investigation model was a learning model that involved students from planning, both in determining the topic and the way to study it through investigation. The group investigation model is a general class organizing plan, where students work in small groups using cooperative inquiry, group discussions, and there is cooperative planning and projects (Sharan & Sharan, 1992; Slavin, 2005). The group investigation model had 6 steps, starting with (1) identifying the topics and arranging students in groups, (2) planning the tasks that were studied, (3) implementing the investigation, (4). report preparation, (5) report presentation, and (6) evaluation (Sharan & Hertz-Lazarowitz, 1980; Sharan & Sharan, 1992; Slavin, 2005, 2015). This stage can improve students' scientific literacy. The group investigation model stages can develop intellectual abilities, the ability to think to relate the material being investigated to real life everyday, the ability to study problems systematically, and the ability to find the truth from information, so that learning outcomes are more meaningful and can be applied in everyday life (Joyce, Weil, & Calhoun, 2009).

The scientific literacy ability of students 'Islamic religious education learning was not only influenced by the application of the group investigation model, but students' learning motivation also influenced it. Motivation is an encouragement that generates individual desire and interest in an activity (Turabik & Baskan, 2015) to obtain self satisfaction and desire (Schunk, Pintrich, & Meece, 2012; Taormina & Gao, 2013). Motivation to learn plays an important role in student success, because motivation can align learning with the desires of students, and bias increases student retention (Suheri, 2019). Learning motivation can influence individuals in learning about what they learn, when to learn, and how to learn (Brophy, 2004), so that it will directly affect student achievement (Papalia, Olds, & Feldman, 2009). Intrinsic motivation is one of the main components of the group investigation model (Sharan & Sharan, 1992) positively and significantly influences student learning (Ferreira, Cardoso, & Abrantes, 2011).

Based on the explanation above, scientific literacy ability of students 'Islamic religious education learning abilities are not only influenced by the learning model applied, but student characteristics also influence it. Reigeluth & Carr-Cheliman (2009) and Degeng (2013) state that learning has three variables covering it, including (1) conditions, (2) methods, and (3) learning outcomes. The three variables influence each other. Therefore, it is necessary to analyze students' scientific literacy abilities in terms of the implementation of the group investigation model and student learning motivation.

II. RESEARCH METHODS

This study used quasy experimental research with the posttest-only control group design. The factorial design uses 2x2, as shown in the following table:

Table 1. Factorial Design 2 x 2

Independent Variable / Moderator Variable		Learning Model	
		Experimental class/ Group Investigation Model (C_1)	Control class/ Expository Model (C_2)
Learning motivation	High (M_1)	C_1 M_1	C_2 M_1
	Low (M_2)	C_1 M_2	C_2 M_2

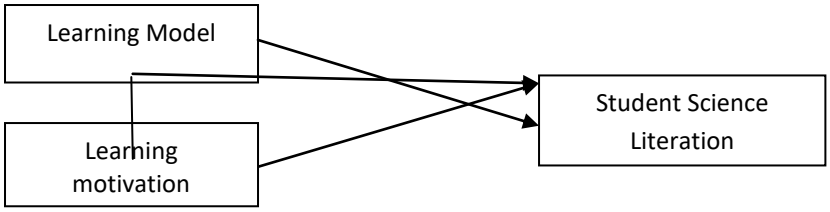
Information:

C_1 = Experimental class (Group Investigation Model)
C_2 = Control class (Expository Model)
M_1 = High learning motivation
M_2 = Low learning motivation

The research sample was taken using convenience sampling technique.. The research sample was students of the Madrasah Ibtidaiyah Teacher Education study program semester 3 of the academic year 2019/2020, with a total of 63 students.

In this study, there were 3 variables including the independent variables, namely (1) the group investigation model learned in the experimental class and the expository model learned in the control class, (2) the dependent variable, namely scientific literacy ability, and (3) the moderator variable, namely learning motivation. The relationship between variables in research is like the following chart:

Chart 1. Relationship Between Variables



The research instrument used was a test for students' scientific literacy skills and a questionnaire to determine student learning motivation. After being tested for validity and reliability, then the hypothesis was tested using the two-way analysis of variance (ANOVA) assisted by SPSS windows.

The normality and homogeneity test used a significance level of 0.05 with a significance value greater than α (Sig> 0.05). The research alternative hypothesis is accepted, if the significance value is smaller than α (Sig <0.05), and if the significance value is greater than α (Sig> 0.05), then the alternative research hypothesis is rejected.

III. RESULTS AND DISCUSSION

This study aims to analyze students' scientific literacy abilities in terms of the implementation of the group investigation model and learning motivation in the Islamic Religious Education (PAI) study program. After testing the validity and reliability of the posttest instrument and motivation questionnaire, the analysis requirements test is then carried out as a preliminary examination of assumptions, so that testing with variance analysis can be carried out. The results of the normality test output are as shown in the following table

Table 2. Posttest Normality Test Output Data

Tests of Normality

	Class	Kolmogorov-Smirnov[a]		
		Statistic	df	Sig.
Student Science Literation	Group Investigation	.115	32	.200*
	Ekspository	.149	31	.079

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

From the table above, the significance value shows that the experimental class is 0.200 and the control class is 0.079. Based on the criteria in the normality test, it shows that 0.200> 0.05 and 0.079> 0.05, then H0 is accepted. So the two Post-test value data are normally distributed. Meanwhile, the results of the

normality test of the learning motivation questionnaire are as shown in the table below:

Table 3. Questionnaire Normality Test Output Data

Tests of Normality

		Kolmogorov-Smirnov[a]		
	Class	Statistic	df	Sig.
Learning Motivation	Group Investigation	.141	32	.104
	Ekspository	.135	31	.161

a. Lilliefors Significance Correction

From the table above, the significance value shows that the experimental class (group investigation model) was 0.104 and the control class (expository model) was 0.161. Based on the criteria in the normality test, it shows that 0.104> 0.05 and 0.161> 0.05 then H0 is accepted. So, the questionnaire value data is normally distributed.
After the normality test is carried out, the homogeneity test is continued as below:

Table 4. Homogeneity Test Output Data

Test of Homogeneity of Variances

Students' Science Literacy Ability

Levene Statistic	df1	df2	Sig.
2.210	1	61	.142

Based on the results of the homogeneity test calculation, it is known that the significance value is 0.142. Because the value obtained from the homogeneity test has a significance level of ≥ 0.05, then H0 is accepted. So, it can be ≥ 0.05, it can be concluded that the data has the same variance (homogeneous).
After these two conditions have been met, the hypothesis testing is continued with the two-way ANOVA technique. The results of the hypothesis test output with the help of SPSS windows are as follows:

Table 5. Test Results of Students' Science Literacy Ability

Descriptive Statistics

Dependent Variable: Students' Science Literacy Ability

Learning Model	Learning Motivation	Mean	Std. Deviation	N
Group Investigation Model	High	83.42	9.020	19
	Low	76.31	7.204	13
	Total	80.53	8.941	32
Ekspositori Model	High	81.30	7.234	20
	Low	64.55	7.815	11
	Total	75.35	10.950	31
Total	High	82.33	8.115	39
	Low	70.92	9.459	24
	Total	77.98	10.237	63

Table 6. Two-way ANOVA test results

Tests of Between-Subjects Effects

Dependent Variable: Students' Science Literacy Ability

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2804.656[a]	3	934.885	14.939	.000
Intercept	345242.542	1	345242.542	5516.658	.000
Model	712.649	1	712.649	11.387	.001
Motivationi	2106.297	1	2106.297	33.657	.000
Model * Motivation	343.678	1	343.678	5.492	.022
Error	3692.328	59	62.582		

Total	389633.000	63			
Corrected Total	6496.984	62			

a. R Squared = .432 (Adjusted R Squared = .403)

Based on the table above, the results of the statistical analysis obtained are first, students 'scientific literacy abilities in terms of the application of the learning model, there is a difference between students' scientific literacy abilities learned by the group investigation model and the expository model shown by the Sig. the learning model is less than 0.05 (0.001 <0.05). The group investigation model had a significant effect on students' scientific literacy abilities. The results of a study by Bagiarta, Karyasa, & Suardana (2018) stated that the group investigation model had an influence on students' scientific literacy abilities.
The group investigation model is a complex model of cooperative learning, placing students as real learners. Students carry out various activities during the learning process starting from selecting and identifying learning topics, planning assignments, investigating learning resources, making reports, presenting reports, and finally conducting evaluations. With various activities carried out, students will gain knowledge and experience from each stage they have done. The results of research by Odom & Bell (2011) stated that from the initial stage to the end of learning, the group investigation model involved the active role of students, so that students would gain knowledge through experience. This model can also consistently increase knowledge of scientific abilities (Parmin, *et.al*., 2016) and help critical thinking and argumentation skills, scientific literacy, understanding scientific processes, and understanding scientific knowledge (Hopkins & Smith, 2011), so that graduates science teacher programs must have independent scientific work including the ability to plan, explore, and find knowledge from various learning sources to obtain comprehensive scientific knowledge (Parmin, *et.al*., 2017). Meanwhile, the expository model is a direct learning model (Killen, 1998) centered on the teacher (Nadjamuddin, Degeng, Dwijogo, & Ali, 2017; Abdullah, 2017), there are not many opportunities for students to be actively involved in learning activities (Dewi & Riswanto, 2019) and only as a listener and passive (Reigeluth, 1999), so that students feel bored (Meutia, 2008) which causes students to have low scientific literacy skills.
Second, students 'scientific literacy skills in terms of learning motivation, there is a difference between high and low learning motivation towards students' scientific literacy abilities, because the Sig. learning motivation is less than 0.05 (0.000 <0.05). This also shows that the high and low motivation to learn will have an influence on students' scientific literacy skills. The results of research by Syah *et.al* (2020) state that learning motivation has a positive effect on scientific literacy skills. Students can achieve the expected learning objectives, if they have learning motivation, so that learning motivation is very important for students to have in learning. The results of research by Handika (2012) and Mendari & Kewal (2015), show that high learning motivation will be able to improve learning outcomes.Motivation is an important psychological factor in the learning process and affects learning development and learning outcomes. Therefore, teachers must be able to foster and increase student learning motivation, so that the objectives in the learning process can be achieved optimally.
Third, Third, the scientific literacy ability of students 'Islamic religious education learning was viewed from the group investigation model and learning motivation, that there was an interaction between the group investigation model and learning motivation on the scientific literacy abilities of students' Islamic religious education learning., because of the Sig. learning model * motivation is less than 0.05 (0.022 <0.05). The results of a study by Bagiarta, Karyasa, & Suardana (2018) show that there is an interaction between the group investigation model and student motivation on scientific literacy skills. The group investigation model and learning motivation both had an influence on students' scientific literacy abilities. Sharan & Sharan (1992); Slavin (2015); Thibout (2017) states that the group investigation model has four integrated basic elements, namely investigation, interaction, interpretation, and intrinsic motivation. The four elements will shape students' perspective on scientific literacy skills for the better. Thus, the implementation of the group investigation model had an effect on the students' scientific literacy skills depending on the high and low learning motivation of the students themselves.

IV. CONCLUSION

Based on the results of the data analysis, it can be concluded that (1) there is a significant effect of the group investigation model on the ability of scientific literacy in students' Islamic Religious Education learning as indicated by the Sig. less than 0.05 (0.001 <0.05); (2) there is an effect of learning motivation on the scientific literacy skills of students' Islamic Religious Education learning as indicated by the Sig. learning motivation is less than 0.05 (0.000 <0.05); and (3) there was an interaction between the group investigation model and learning motivation on students' scientific literacy skills as indicated by the Sig. learning model * motivation is less than 0.05 (0.022 <0.05). The scientific literacy ability of students'

Islamic Religious Education learning was influenced by the implementation of the group investigation model and learning motivation.

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