THE INFLUENCE OF GROUP INVESTIGATION ON THE ABILITY OF CRITICAL THINKING AND SCIENTIFIC WRITING

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ABSTRACT

This study describes the effect of implementing group investigation method on students' critical thinking and the completion of assignments in setting background abilities. This research method is descriptive by applying the group investigation learning method to the Indonesian Language course with eight steps, namely the focus of learning, selecting topics, planning in groups, implementation, analysis and synthesis, presentation of results in front of the class, evaluation, and assessment. As for the research subjects, there were 70 students being in the second semester of the 2019-2020 academic year in the Accounting Study Program at Darma Cendika Chatolic University, Surabaya. The conclusion of this study was that there was a significant effect on the implementation of the group investigation learning method on the critical thinking ability of 85.5% and on the completion of the task of compiling the background by 48.64%.

***Keywords**: group investigation, critical thinking, background*

INTRODUCTION

When carrying out the preparation for teaching Indonesian Language course, the researcher conducted interviews with several lecturers and all Heads of Study Programs at Darma Cendika Catholic University (DCCU). She wants to get an idea of what is perceived to be very urgent to study together in the Indonesian Language course. The course lecturers and the Head of Study Program provided information that DCCU students have weaknesses in composing sentences and that, in the end, makes it difficult for the lecturers to guide the proposal or thesis. Some of the lecturers stated that when guiding the preparation of proposals or theses at the same time they also became lecturers in the Indonesian Language course. This has been acknowledged by others and considered to be true, because when paying attention to the guidance process for the preparation of proposals and theses the supervisor has incised a lot of red ink to correct the sentences compiled by the students.

Why most DCCU students have difficulties in composing sentences in writing scientific papers even though they are already there in the final semester? According to the experiences of the lecturers, most DCCU students only learn to read reference books without looking for connections. According to the lecturers, most students are lack of the willingness to think critically so that they could not relate to one another. They are mostly strong in memorizing text books or reference books.

In fact, there are several things that are required for students, such as independence in learning and being able to think critically so that they are able to complete specific tasks related to scientific writing. For this reason, the lecturers should provide the assistance to the students for developing their critical thinking. Moreover, when it is time for us all to enter the education era 5.0, it is crucial to develop critical thinking in students so that they can compete in the future. The lecturers must be able to develop learning methods that may adapt to the needs of

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contemporary students and technological advances. The lecturers must be able to spread passion and provide inspiration and be able to be friends for students and also role models for them (LSP31, 2019).

Furthermore, LSP31 (2019) explained that one of the keys to facing the challenges of current and future education is creativity and innovation. The development of critical and creative thinking skills and solving problems related to the lives of students is very important. This awareness needs to be used as a foothold in promoting contextual learning. For this reason, lecturers need to take action, seriously design learning based on the premise of the learning process. More innovative demands in the learning process and hopes for the development of critical thinking in relation to the quality of college graduates.

For that, learning from what other lecturers have done is very useful. In the application of learning methods to develop critical thinking, many studies have been carried out, such as research on analyzing the critical thinking skills of Mathematics education students in solving real analysis problems (Widodo, Suryo; Santia, 2019). The study showed the results of two out of 24 students with a high critical thinking level. Meanwhile, there is a study about the critical thinking ability of students in the science education study program in the case of one-dimensional kinematics graph shows the results that students have critical thinking skills in the low category (Kirana & Kusairi, 2019). The ability to think critically and complete assignments in the field of language, especially Indonesian, has been researched as well and gives the results of student literacy in the course of discourse subject to the low category; students' thinking skills in understanding text are included in the less critical category. The student's ability to analyze text on syntax and semantics is mostly in the good and adequate category, while their critical thinking skills in understanding texts with the CDA approach are still lacking because students in analyzing discourse are still structural (Anshori, 2009).

Research on critical thinking skills of Biology education students through solving environmental problems has also contributed to research that results in critical thinking and problem solving skills which have a relationship with one another (Santi et al., 2018). Research on improving students' critical thinking skills in carrying out nursing practices has been carried out and shows the results of the students' critical thinking skills scores are the cumulative value of critical thinking skills scores which have four elements, namely interpretation, analysis, inference, and evaluation skills (Jannati, 2019).

Next, it is inextricably important that the students may need to develop critical thinking and have the ability to complete tasks in the world of higher education so that many researchers have examined various approaches regarding the subjects taught by researchers. In regards to this, the Indonesian Language course has a strategic role in the development of critical thinking and the completion of tasks in setting background because the Indonesian Language course is directly related to the world of writing which relies on critical thinking skills. In addition to the material that must be up to date, actual, and following various challenges, the learning methods used are also very important so that they can encourage students to have the ability to think critically and develop backgrounds that become the embryos of scientific writing, such as writing proposals and theses.

Discussions, compiling discussion reports, presenting discussion reports are ways to develop critical thinking. The GI learning method was chosen as a means of improving the development of critical thinking and the ability to complete the task of arranging background for second semester students in the Indonesian Language Subject. Through the process of looking for material, discussing it, compiling reports, and presenting, as well as answering questions or providing responses to statements, students are invited to improve their critical thinking development. Armed with the ability to think critically and practice writing by paying attention to the content that

must be in the background, it is hoped that it will smoothen the matter of completing the task of preparing the background. Thus, it can facilitate students in completing their final assignments specifically in terms of preparing proposals and theses.

Based on the explanation above, the researcher focused on examining the use of the GI learning method for the development of critical thinking and the ability to complete the task of compiling background using the second semester students of the 2019-2020 academic year in the Indonesian Language course in the Accounting Study Program at DCCU. Based on previous research and concerns experienced by the lecturers at DCCU, the focus of this research is something new that has the opportunity to be researched.

From the research focus above, there are two questions to answer.

1) What is the effect of the implementation of the GI learning method on critical thinking skills?
2) What is the effect of the implementation of the GI learning method on the ability to complete assignments of compiling background?

LITERATURE REVIEW

Based on the research focus as outlined above, it is then necessary to understand the concepts or theories about GI learning model, critical thinking, and background in scientific writing.

Group Investigation Learning Methods

Learning method is one fundamental element in any learning system, which is included in the management of learning. Learning taps upon at least six (6) aspects; and one of which is management. The learning method is part of the management of learning in this case. Through the selected learning method, the material is managed and designed in what way or how it should be delivered to the students (Arikunto, 2020).

To be able to stimulate the brain to become critical, challenging learning methods are needed. This learning method should be able to make the mind or brain active. In order to practice that, active learning style is needed. To be active learners, students must do assignments. They have to use their brains, learn new ideas, solve problems, conceptualize new understandings, and apply what they learn. Active learning must be agile, fun, and passionate. Moreover, students often leave their seats, move freely and think hard (moving about and thinking aloud) (Silberman, 2006). In active learning, students look for information, answers, or other alternatives for solution to the problems at hand or find solutions to the task they face. Active learning can also help students and encourage them to master tedious teaching materials.

Active learning methods can be done in a group (Shott, et al., 2013). Learning in groups becomes increasingly meaningful to collect qualitative data from many individuals simultaneously. It needs to be well-planned and offering participants an informal and friendly atmosphere to discuss common topics. Learning in groups can be the key to generating rich and complex data. In groups, students study different topics in focus and other necessary materials. Two group members will present materials developed together to work on problems in the group. Meanwhile, the remaining group members will act as participants for the facilitator of the group. The purpose of learning in groups is to (1) design activities in groups, (2) develop topics that are their task and instructions in guiding the group, (3) gain experience in facilitating groups, (4) understand the rules for how members getting involved, (5) provide self-experience as participants, facilitator, and coordinator, (6) understand the methods used and the group dynamics, as well as discussion ethics in groups.

The GI learning method is one type of learning in groups. GI is a learning method that involves students working together to investigate certain topics that they must complete (Sejnost, 2000). The GI method tries to include into one teaching strategy the forms and dynamics of the democratic process and the process of academic inquiry. GI was proposed by Herbert Thelen (in Siddiqui, 2013), who tries to develop learning experiences that can be felt in real life situations characterized by a strong level of inquiry. Later, GI was developed by Sharan & Sharan (1976) as a complex learning method. It requires students to have communication skills and good group process (Killen, 2007). In addition, GI is a method for class instruction (Sharan and Sharan, 1992). Students work collaboratively in small groups to test, experience, and understand their study topic (Ahsanah, 2015).

Conceptually, GI is a learning method that requires students to interact with one another. The GI method requires communication and critical thinking skills. This is because the GI method is a method of working together in groups that also inevitably asks students to trust each other. Students must collaborate to discuss topics that must be resolved.

As an active learning method, GI has steps or processes for its implementation. The following points are included in the GI steps according to Killen (2007). The first is putting the focus of learning, in which the educator presents several topics which then be selected together with the topics to be discussed. Second, choosing a topic, after a number of topics have been agreed upon, then each group consisting of 4-5 people chooses a topic for the group. Third, planning in groups, the educators facilitate the students in their groups to plan procedures, steps to complete the assignments, and specific learning objectives in accordance with the selected sub-topics. Fourth, implementation, the students discuss in groups according to the procedures and steps that have been determined. The educators provide assistance when needed. Fifth, conducting analysis and synthesis, in groups, the students analyze and evaluate the information obtained in step 4. The group then plans how to compile a report and an interesting way of presenting it to the class. Sixth, conducting presentation of results in front of the class, according to their turn, with each group submits the results of their investigations through presentations to the class. Seventh, setting the evaluation, evaluating how each member of the group contributes to the overall process of working together in the group. Lastly, as for assessment, the teacher needs to provide an assessment for groups and each individual.

Critical thinking

Critical thinking can be traced back since the time of Socrates. He explained that critical thinking is a reflective activity. Socrates' practice was followed by supporters of critical thinking, namely Plato, who noted Socrates' thinking, Aristotle, and the Greek tradition which emphasized that only the trained mind was ready to think critically. That ancient Greek tradition arises the need for anyone who aspires to understand deeper realities, think systematically, and explore its broad and deep implications. Only a thought that is comprehensive, well-reasoned, and responsive to objections can carry a man beyond surface. In the Middle Ages, the systematic critical thinking tradition was embodied in the writings and teachings of thinkers such as Thomas Aquinas (*Summa Theologia*) who ensured his thinking to meet the test of critical thinking, always systematically stated, considered and answered all criticisms (Paul, et al., 1997).

Critical thinking is an activity of thinking process. According to Bailin et al. (1999b) (in Hitchcock, 2018), the use of the term 'critical thinking' is to describe the goals of education as the American philosopher John Dewey (1910), often calls it 'reflective thinking' (Johnson, 2002). A person can be categorized in a critical thinking

group if he has at least three characteristics: (1) able to make decisions about what to believe or do; (2) meet the standards of adequacy and accuracy in accordance with the thoughts; and (3) meet the relevant standards for several threshold levels.

Critical thinking is goal-directed thinking. Bailin et al. (1999b) defines critical thinking as active, persistent, and careful consideration of any belief or form of knowledge based on the reasons that support it, and further conclusions and identifies habitual judgement with scientific attitudes (Johnson, 2002).

The thinking process requires an open mind, humility, and patience. These things help a person to achieve the maximum possible understanding to see the meaning behind the information and events. Critical thinkers remain open-minded when they seek reasonable beliefs or truth based on scientifically written books that are logical, and valid. Critical thinking certainly cannot be separated from the thinking process itself. As for the thinking activities Dewey (in Johnson, 2002: 1966) said that "... schools should, above all, teach children to think". Further, explained by Vincent Ruggiero (1988) as quoted by Johnson (2002) defines thinking, as "any mental activity that helps formulate or solve a problem, make a decision, or fulfill a desire".

Dewey (1933, in Hitchcock, 2018) explains that the critical thinking process consists of five phases, namely (1) suggestions, in which the mind provides possible solutions, (2) intellectualization of difficulties into problems to be solved, a question that must be answered, (3) the use of one suggestion as the main idea, or hypothesis, to initiate and guide observations and other steps in the collection of factual material, (4) mental elaboration of an idea or presumption as an idea or presumption (reasoning, in the sense in which reasoning is a part, not a whole, a conclusion), and (5) test hypotheses with real or imaginative actions.

Improving critical thinking skills requires an open mind, humility, and patience. The thinking process involves the whole mentality to help solving the problems, make decisions, and meet the needs concerned. Critical thinking is not only related to thought or logic, but also with attitude. Thus, the characteristics of developing critical thinking are students to (1) have an open mind, which means that students are able to see problems from various aspects, collect related information, sort information efficiently and creatively, reason logically and make results that can be trusted and can be accounted for logically scientific to then be useful for success in life; (2) think sensibly, that is, students are able to raise relevant and logical questions; (3) have the humility to listen to the opinions of others; and (4) have the patience to be able to wait for others to express their opinions.

Background

When a writer writes the topic of his writing, one of the basic things that is made first is the background. The background of this research establishes a research context that explains why the research topic is important so it is imperative to understand the main aspects of research. Usually, the background is the first part of a research article/thesis and that explains the importance of conducting research and summarizes what the research wants to achieve (Sachdev, 2018). From the reader's point of view, explaining the background is one of the most important elements for the reader.

Providing background is one of the first steps in completing a paper. It includes an overview of the area under study, current information about the issues to be written, previous studies, and relevant history of the problem. An ideal background is that which puts forward history and information on research topics. This helps the authors prove the relevance of the research topic questions to develop the problems to be studied (Alleyne, 2016).

There are several things that must be disclosed in the background, such as the author describing historical developments in the literature leading to his research topic. If this research is interdisciplinary, it should describe how the various disciplines are connected and what aspects of each discipline will be studied. The author should also briefly highlight the main developments of his research topic and identify key gaps that need to be addressed (Sachdev, 2018). In other words, this section should provide an overview of the research undertaken, which consists of (1) what is known about the topic, (2) what gaps or missing links need to be addressed, (3) what the importance of addressing the gaps is, and (4) what the researchers' reasons and hypotheses are. The background should provide general information about the research topic and emphasize the main objectives of the research. The background section should discuss the researcher's findings chronologically to highlight progress in the field and points that still need research. The background must also reveal a summary of the researcher's interpretation of previous research and what the research wants to achieve.

The background content of the problem includes important and relevant studies that either support or refute the research itself. What is contained in the background becomes a basis for identifying problems, research reasons, and questions. The background to the problem also links the introduction to the research topic and confirms the flow or logic of the research. Thus, the background helps researchers or readers to understand the reasons for conducting research (Information, 2019). There are at least three things that must be written in the background, namely (1) the reasons for choosing the research theme and why it is important to do research; (2) the historical context of the problem to be studied; and (3) the concept of solving the problem to be studied.

The background as an initial condition that answers the question of why a problem will be studied. The content of the background contains exposure to the problem, supporting data for the occurrence of the problem, analysis of the cause of the problem based on supporting theories, the solutions offered to overcome the causes of the problem. In the background, it is better to disclose the symptoms of gaps in reality as a rationale for raising problems (Kristanto, 2018). Therefore, the background contains what makes researchers feel anxious and restless if the problem is not researched (Listhyanita, 2019).

Based on the description above, it can be concluded that the background is the earliest and most important part of a paper or research. The background content of the problem is the reason why an issue is important to be researched. There are at least three things that should exist in the background, namely (1) ideal conditions which include conditions that are aspired or expected to occur; (2) the actual condition which is a condition that is happening at this time, which usually tells the difference between the current condition and the condition that you want to happen; and (3) solutions which are short suggestions or offer solutions before proceeding further to the subject.

RESEARCH METHODS

This research was a descriptive study that implements the GI learning method. There were 70 students in the second semester of the 2019-2020 academic year in the DCCU Accounting Study Program who were taking the Indonesian Language course become the subjects of this research. The implementation of the GI learning method follows eight steps, namely conducting (1) focus of learning, (2) selecting topics, (3) planning in groups, (4) implementation, (5) analysis and synthesis, (6) presentation of the results to the class, (7) evaluation, and (8) assessment.

The steps in the GI learning method are evaluated on how high it improves the development of students' critical thinking which includes (1) having an open mind; (2) thinking sensibly; (3) having humility; (4) having patience. The GI learning method is also evaluated on how high it improves the ability to solve the task of compiling the background, which at least the background has three elements, such as (1) the ideal condition includes the desired or expected condition to occur; (2) the actual condition is a condition that is happening at this time, usually tells the difference between the current condition and the condition that you want to happen; and (3) the solutions which are short suggestions or offer solutions to problems experienced before proceeding further to the subject .

The data collection instrument used three questionnaires, namely (1) a questionnaire with the answers implemented or not implemented for the assessment of the implementation of the GI learning method; (2) a five-scale Likerd questionnaire which is a critical thinking assessment instrument, and (3) a questionnaire with the contents of the number of elements contained in the results of the background arrangement of the problem by choosing the answer to the background has three elements, two elements, or one element to assess the assignment of setting the background. The data collection was carried out twice, namely the implementation of the GI learning method in the middle of the semester and at the end of the semester.

The data were analyzed by using the descriptive analysis. The percentage is used to describe the implementation of the use of the GI learning method, the ability to think critically, and the completion of the assignments to compile background. The results of the first data analysis will be the basis for re-implementing the GI learning method with certain actions so that proving or not the implementation of the GI learning method affects the ability to think critically and completing the task of preparing background.

RESULTS AND FINDINGS

The implementation of the GI learning method has been designed from the preparation of a learning implementation plan (RPP). At the first meeting with the students, it was explained about how the learning process with the GI learning method. When a study contract is agreed upon, the GI learning method is immediately applied and its implementation begins according to the GI steps. The lecturer explains and together with the students implements the GI learning method step by step, namely (1) learning focus, (2) choosing topics, (3) planning in groups, (4) implementation, (5) analysis and synthesis, (6) presentation of results in front of the class, (7) evaluation, and (8) assessment. The evaluation was carried out as a whole, so that it did not present the results of step-by-step data analysis and also for the ability to think critically and prepare the background.

In this study, the focus was on the implementation of GI learning methods to improve critical thinking skills and completion of tasks in preparing background. After the learning took place for the first three months, an evaluation of the use of the GI learning method was conducted by taking the first data. The results of the first evaluation became the basis for action to re-implement the GI learning method which was then evaluated at the end of the semester.

In implementing the GI learning method after the first evaluation, students were reminded of the GI steps and trained in practice every step of the way. In addition, students were also reminded again of the importance of critical thinking skills and completing assignments to prepare background as one of the important things in preparation for carrying out final assignments, compiling research proposals and theses. For this reason, exercises and implementation of GI learning methods were required to be re-evaluated at the end of the second semester.

This was to prove whether or not there was an effect of the GI learning method on critical thinking skills and completing tasks in preparing background. The results included correlational analysis and regression analysis.

1. The relationship between the GI learning method and the ability to think critically and to solve tasks to develop background

To find out how much the relationship between GI learning methods and critical thinking skills and task completion in compiling background can be seen from the results of the correlation analysis as presented in Table 1 and 2 below.

Table 1. The First Evaluation Correlation Analysis Results

	GI	*BG*	*CT*
GI	1		
BACKGROUND (BG)	0,520487	1	
CRITICAL THINKING (CT)	0,300030523	0,879971362	1

Table 2. The Second Evaluation Correlation Analysis Results

	GI	*BG*	*CT*
GI	1		
BACKGROUND (BG)	0,697476614	1	
CRITICAL THINKING (CT)	0,924770394	0,866669487	1

To find out how strong the correlation between GI and the completion of the task of composing background is and GI to the development of critical thinking is, we need to know the value of r^{table}, as follows.

Table 3. Value of r^{table}

r^{table}	**Interpretation**
0	Uncorrelated
0.01-0.20	Correlation is very low
0.21-0.40	Low correlation
0.41-0.60	Correlation is rather enough
0.61-0.80	Correlation is enough
0.81-0.99	High correlation
1	Correlation is very high

From Table 1 and 2 above, it can be seen that there is a correlation between the GI learning method and the ability to think critically and to solve the task of setting background. The value of the relationship is indicated by the results of the r value which is greater than zero (0). In Table 4, it can be seen that the results of the r value from the first and second evaluations and their categories indicate how big the relationship is.

Table 4. Comparison of First and Second Evaluation r Value Correlation of GI Learning Methods Against the Ability to Think Critically and Complete Tasks to Arrange Background

		r Value					Difference (%)
	Evaluation I	**Percentage (%)**	**Category**	**Evaluation II**	**Percentage (%)**	**Category**	
BG	0,520487	52,04	Rather adequate	0,697476614	69,74	Sufficient	17,7
CT	0,300030523	30	Low	0,924770394	92,47	High	62,47

The value of the relationship between the GI learning method and critical thinking skills in the first evaluation was 30%, which means that it was in the low category and in the second evaluation it was 92.47% which meant it was in the high category. The increase that occurred was 62.47% so that there was a jump in the value of the correlation, from low to high categories. Furthermore, the relationship between the GI learning method and the completion of the task in preparing the background in the first evaluation was 52.04% and the second was 69.74% which means an increase of 17.7%. This increase from the category is considered to be adequate to sufficient. Thus, the conclusion is that there is a correlation between the use of the GI learning method on critical thinking skills and the completion of the task of preparing background.

2. The Effect of Group Investigation Learning Methods on Critical Thinking Ability

In tables 5 and 6, the following are the results of regression analysis to determine how high the influence of GI is on critical thinking skills.

Table 5. Regression Analysis: The Effect of Group Investigation Learning Methods on Critical Thinking Ability in the First Evaluation

Regression Statistics	
Multiple R	0,015444724
R Square	0,00023854
Adjusted R Square	-0,014463835
Standard Error	1,099721132
Observations	70

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	3702,6306	3702,631	1,092971	0,29951602
Residual	68	230361,9	3387,675		
Total	69	234064,53			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	4504,540345	809,0374796	5,567771	4,7556E-07	2890,13119	6118,9495	2890,13119	6118,9495
GI	-38,59487069	36,91690345	-1,045452	0,299516	-112,2614	35,07166	-112,2614	35,07166

Table 6. Regression Analysis: The Effect of Group Investigation Learning Methods on Critical Thinking Ability in the Second Evaluation

Regression Statistics	
Multiple R	0,924770394
R Square	0,855200281
Adjusted R Square	0,853070874
Standard Error	0,595591211
Observations	70

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	142,4641	142,4641	401,6142	0,0000
Residual	68	24,12156	0,354729		
Total	69	166,5857			

	Coeffi-cients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	-2,6323985	0,963033	-2,73345	0,007982	-4,5541	-0,7107	-4,5541	-0,7107
GI	0,96717006	0,048261	20,04031	3,04E-30	0,870866	1,063474	0,870866	1,063474

To determine whether there is a significant effect on the implementation of the GI learning method on critical thinking skills, it can be seen from the F^{count} value. If F^{count}> from F^{table}, it shows a significant effect. The value of F^{table} with the number of observers as many as 70 and the number of variables as many as 3 is 3.155. Through Table 7 below, the effect of implementing the GI learning method on critical thinking skills can be seen.

Table 7. Calculation Results Effect of Implementation of GI Learning Methods on Critical Thinking Ability

	The First Evaluation				**The Second Evaluation**			
	CT	**GI**			**CT**	**GI**		
Coefficient	4504,540345	-38,59487069	R^2 CT = 0,00023854	**Significant**	-2,632398462	0,967170059	R^2 CT = 0,855200281	**Significant Value** 85,52%

	The First Evaluation				The Second Evaluation			
	CT	**GI**			**CT**	**GI**		
				Value 00,02%				
Standart error	809,0374796	36,91690345	F hitung = 1,092971**		0,963032993	0,048261224	F hitung = 401,6141717**	
t	5,5677771*	-1,0454525*			-2,733445777*	20,04031366*		
Conclusion	There is no significant effect between the implementation of GI learning methods on critical thinking skills because the value of $F^{count} < F^{table}$, which is 1.092971 <3.155.				There is a significant effect on the implementation of GI learning methods on critical thinking skills because the value of $F^{count} > F^{table}$, which is 401.6141717> 3.155 with a significance value of 85.5% which means it is in the high category.			

Although the results of the first evaluation are not good because the results of the analysis show that there is no effect of the GI learning method on scientific thinking skills, seeing an increase in the relationship and even jumping from low to high, the implementation of the GI learning method needs to continue to be carried out by re-explaining to students the GI steps, explaining the importance critical thinking skills, and completing college assignments.

From Table 7, the second evaluation proves that there is a significant effect on the implementation of the GI learning method on critical thinking skills. The proof is that the value of $F^{count} > F^{table}$ is found, which is 401.6141717> 3.155 with a significance value of 85.5% which means that it is in the high category.

3. The Effect of Group Investigation Learning Methods on the Problem-solving Ability to Arrange Background

Tables 8 and 9 are the results of regression analysis to determine whether there is a significant effect on the implementation of the GI learning method on critical thinking skills.

Table 8. Regression Analysis: The Effect of Group Investigation on Task Completion Ability to Arrange Background on the First Evaluation

Regression Statistics	
Multiple R	0,125772991
R Square	0,015818845
Adjusted R Square	0,001345593
Standard Error	58,20373702
Observations	70

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	3702,631	3702,631	1,092971	0,299516022
Residual	68	230361,9	3387,675		
Total	69	234064,5			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	4504,5403	809,0375	5,567777	4,76E-07	2890,1312	6118,9495	2890,13119	6118,9495
GI	-38,59487	36,9169	-1,04545	0,299516	-112,2614	35,0716632	-112,2614	35,0716632

Table 9. Regression Analysis: The Effect of Group Investigation on Task Completion Ability to Arrange Background on the Second Evaluation

Regression Statistics	
Multiple R	0,697476614
R Square	0,486473627
Adjusted R Square	0,478921768
Standard Error	79,85393982
Observations	70

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	410769,5	410769,5	64,41774	0,000
Residual	68	433612,3	6376,652		
Total	69	844381,8			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95%*	
Intercept	5915,73398	129,1187	45,81624	7,52E-53	5658,082	6173,386	5658,082	6173,386
GI	51,933683 5	6,470627	8,026066	1,97E-11	39,02175	64,84562	39,02175	64,84562

To facilitate the understanding whether or not there is a significant effect of implementing the GI learning method on the ability to complete the task of compiling the background, it can be noted that Table 10 below shows the results of this effect in the first and second evaluations.

Table 10. The Calculation Results Effect of GI Learning Method Implementation on Task Completion Ability to Arrange Background

	The First Evaluation				**The Second Evaluation**			
	BG	**GI**			**BG**	**GI**		
Coefficient	4504,5403	-38,59487	R^2 BG = 0,015818845	**Significant Value 01,58%**	5915,733984	51,93368352	R2 BG = 0,486473627	**Significant Value 48,64%**
Standart error	809,0375	36,9169	F = 1,092971		129,1187265	6,47062746	F = 64.417737**	
t	5,567777*	-1,04545*			45,81623553*	8,026066071*		
Conclusion	There is no significant effect on the implementation of the GI learning method on the ability to complete the task of setting the background because the value of $F^{count} < F^{table}$, which is 1.092971 <3.155.				There is significant effect on the implementation of the GI learning method on the ability to complete the task to compile the background because the value of $F^{count} > F^{table}$, which is 64.417737> 3.155 with a significance value of 48.64% which belongs to the fairly sufficient category			

From Table 10 above, the findings of the second evaluation prove that there is a significant influence on the implementation of the GI learning method on the ability to complete the background assignment. The proof is that the value of $F^{count} > F^{table}$, which is 64.417737> 3.155 with a significance value of 48.64% which is included in the fairly sufficient category. The significance value is 48.64% which is included in the fairly moderate category.

CONCLUSION

From the discussion above, it can be concluded that, there is a correlation between the implementation of the GI learning method on the ability to think critically and to solve the task of background. In the second evaluation, the correlation has increased, for GI to critical thinking skills increased from the low category to the high category, namely from 30% to 92.47% which means that there was a very high increase of 69.74%. Likewise, the correlation of the GI learning method to the completion of the task of compiling the background also increased from the fairly moderate to sufficient category, r 52.04% to 69.74% which increased by 17.7%.

There is a significant effect of the implementation of the GI learning method on the ability to think critically and solve the task of background. First, the implementation of the GI learning method to critical thinking skills is proven to have a significant effect. The proof is the value of F^{count} of GI implementation on critical thinking ability shows that $F^{count} > F^{table}$, namely 401.6141717> 3.155 with a significance value of 85.5% which means that it is in the high category. Second, it is also proven by the implementation of GI on the completion of the task to compile the background where the value of $F^{count} > F^{table}$, which is 64.417737> 3.155 with a significance value of 48.64% which belongs to the fairly sufficient category.

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