

# THE APPLICATION OF LEARNING GROUP INVESTIGATION MODEL TO IMPROVE STUDENTS' LEARNING OUTCOME OF AGRICULTURAL TECHNOLOGY EDUCATION DEPARTMENT

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## Abstract

This study aims to improve learning outcomes through the learning model of Group Investigation (GI) agricultural technology education students. The subjects were students of Agricultural Technology Education 2013/2014 as many as 44 people. This research is a classroom action research (classroom action research) consisting of 2 cycles of the stages of implementation include: planning, implementation / action, evaluation and reflection repeatedly. Data were analyzed qualitatively the results of data observation, and quantitative scores of learning outcomes. The results of this study indicated that there was an increase in student learning outcomes. This increase of completeness classically seen in the first cycle was 70.46% and then increased to 95.45% in the second cycle. Quantitatively, there was a change to the student during the execution of the activity took place. Based on these results it can be concluded that the model of cooperative learning through Group Investigation (GI) could improve the learning outcomes of students of Department of Education of Agricultural Technology, Faculty of Engineering, State University of Makassar.

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**Keywords:** Learning Group Investigation; Model; Students' Learning Outcome.

## 1. Introduction

Experience is an essential element in the construction of knowledge either the search for meaning together in social activities, or personal model of reality. In this case, the knowledge is a shared experience, so the truth is established and agreed upon. Dealing with learning innovation in encouraging students to be more actively involved in the form of initiatives and contribute, it will direct the belief that knowledge is the result of social interaction.

Based on the result of observation research team on Agricultural Study Program, it was found that many students in the learning process were less proactive, less attention and low motivation toward a subject taught by the teacher (lecturer). The problem occurs because the students had not much chance in which they were actively involved in the learning process as mentally and physically through the class interaction, moreover, the students lack of participation in asking

questions and expressing ideas because they were less trained for discussion.

Group investigation (GI) takes the model prevailing in the society, especially about how members of the society do the process of social mechanism through a series of social agreement. In line with the concept of Group Investigation (GI) model, with these agreements, it allows the students to learn about their academic knowledge and engage the students in problem solving. Group Investigation (GI) model is one of the five types of cooperative learning models, where teachers and the students work together in building learning. Students must be active in several aspects, such as seeking information from various sources such as the internet or gives the ideas during the learning process, while the group functions as the a mean to interact in forming a concept of learning. In addition, regarding the selection of topics, each group member chooses the appropriate

agreements related to the things that will be investigated.

The specific benefit of Group Investigation (GI) model is the students' confidence can be increased to use the knowledge and expertise that is useful for groups and foster harmonious cooperation among them with different backgrounds. One of the weaknesses from recognition is quite complicated because it emphasizes the publication. In the implementation of cooperative learning model, especially in Group Investigation (GI) model, it is expected that it can increase the activity of the students in the leaning process, because in cooperative learning model the students are required to be proactive during group learning activities. Their involvement or activeness in the learning process can increase the learning outcomes of the students. Wiratana et al (2013) stated that there are the differences between skills and the learning result from students who have cooperative learning model such as Group Investigation (GI) compared with students who undertake conventional learning.

Based on the background above, the research poblem of this study is; How can Group Investigation (GI) be used to improve learning' outcomes of Learning Strategy subject of the students at Learning Technology Education?

Generally, the objective of this research is "Implementing Group Investigation (GI) model to improve learning' outcomes of Learning Strategy subject of the students at Learning Technology Education meanwhile the specific objective of this research is to improve learning outcomes of Learning Strategy subject of the students at Agriculture Technology Education

According to Driscoll (1994), there are two things to be considered in learning, namely:

1). Learning is a permanent change in individual's performance , and 2). Learning outcomes that arise from the students due to or the result of interaction with the environment. Learning is an active process in gaining an experience of a new knowledge lradng to changes in behavior (Gerlach, 1971). A change

in behavior occurs as the result of learning process, and changes in behavior as a result of learning includes three domains: affective, cognitive, and psychomotor (Anderson, 2011).

The dimensions of cognitive process or learning aspects is focused on two categories namely understand and use. Knowledge dimension includes: *factual knowledge*, *conceptual knowledge*, *procedural knowledge*, and *metacognition knowledge*. The capability of learning outcomes that can be measured from the students are : (1) *intellectual skills*, (2) *cognitive essay*, (3) *verbal information*, (4) *motor skills*, and (5) *attitudes*. One point of the concern from that capability categories is intellectual skill ( Gagne& Briggs, 1979).

Jenkins & Unwin (1996) deeply asserted that the learners can do something as the learning outcomes as the result of the capability, Percival &Elington (1984) stated that the learning outcome is the capability measured from individual changes expected. Learning outcome is the sedentary change of behavior in someone and his or her environment (Uno, 2008). From those statements, it can be said that the learning outcome is an acquisition of learning owned by the students after going through a learning process on the dimension of cognitive process, they are analysis and evaluation, and the dimension of metacognitive knowledge related to the learning strategy.

Group Investigation (GI) model involves the studnets since planning, both at the selection of the topics or how to learn it through the process of in-depth investigation. This model requires learners to have a good communication skills and group process skill. In using this Group Investigation (GI) model, generally the students in the classroom will be divided into some groups with 5 to 6 members or students with heterogeneous characteristics. The division of the groups also can be done based on their friendships or common interests to certain topics. The students choose the topic they want to learn, following an in-depth investigation to various topics chosen and then prepare and present a report in front of the class (Arends, 1997:120-121).

*Group Investigation* (GI) is a type of cooperative learning that can build the cooperation between the teacher and the students in learning process. The procedure of joint planning is based on the experience of each student, based on the capacities and needs. Students actively participate in all aspects of making decision in order to decide their goals. The group functions as a media for social interaction. The group planning can guarantee the fully involvement of all the learners in this model.

In *Group Investigation* (GI) model, there are three main concepts, namely : (1) The research, a process of directing students to get stimulated by turning on an issue. Students feel that they need to give a reaction regarding to the problems need to be resolved. This problem is obtained from the students themselves or given by the teacher; (2) The knowledge, the experience that is not inborn but acquired by the students through the experience directly and indirectly; (3) Group dynamics to show the situation that describe a group of individuals interacting each other about something accidentally seen or studied along with a variety of ideas and opinion and exchanging experiences and argue with each other and the discovery through the thinking systematically. Knowledge is not the facts of recalling results, but from the process of finding himself.

Arends( 1997:121) suggested six stages of activity in *Group Investigation* (GI) model, they are : (1) Identify the topic and the formation of this group stages emphasizes on the problems where the students research, propose the topics and suggestion. This role is started when the students are given the model containing the latticework, and from this phase, it is expected that the students can guess what topic will be explained to them. Then the students with the same topics will be classified into a same group in the later investigation. In this case, the teacher role is to limit the amount of groups and help to find out the information and facilitate the setting (Grouping, specify the number of group members, determine the source, choose the topic, and formulate the problem). (2) Planning the task to be learned, and in this stage the group members will

decide the subtopics that will be investigated by filling out the worksheet provided and collecting the sources to solve the problem that has been investigated by the small groups (Planning, deciding what will be learned, how to learn, who do what, the goal). (3). Conducting the investigation, where the students will find the information individually or in pair, analyze and evaluate as well as conclude it. Each member of the group contributes to one of other important parts for their own group. Other group members can help and discuss the differences by exchanging the information and collecting those ideas into on a single collection. (Investigation, ideas and information exchange, discussion, clarification, collecting the information, analyze and make the inference). (4) Prepare a final report. In this stage, it is the the level of organization by integrating all parts into a whole and plan a presentation in front of the class. Each group has appointed one of their members to present about the report of the final result from their investigation where each of their members will listen to. The role of the teacher here is as the advisor to help the students by making sure that each group's member involves in it. (Organizing, member of the group writes the report, planning the report presentation, the determination of the presenter, moderator, and the reporter). (5) Presenting the final result, each group is ready to give the final result in front of the class using presentation. From this various presentation, it is expected that the other groups can actively evaluate the clarity of each group's reports by using question and answer. (Presenting, one of the groups presents, other groups observe, evaluate, clarify, asking questions, or responses). (6) Evaluating, where in this stage the teacher gives responses from each topic of their experience. Other students and teachers collaborate to evaluate the learning process so that all the students are expected to master all the subtopics provided. (Evaluating, each student correct their own reports based on the class discussion, students and the teacher collaborate to evaluate the lesson, assessing the learning outcomes that is focused on the achieving the understanding).

In this Group Investigation (GI) model, the students act as the mediator, facilitator, and directing. The role of the students are to guide and to set the group through three stages: (a) The phase of problem solving (b) the phase of classroom management; (c) the phase of individual meaning.

Learning strategy course is one of the courses that emphasizes on competency standard where they can reflect the concept of learning strategy orally and written and it can be implemented in the process of learning, especially at the Agricultural Technology Education study program. Besides, the objective of study is oriented at the creation of understanding that demands creative productive activity in the real context and the sequence of learning following the views of the students and the process. In this case, to set the logical reasoning of each student, instill the values of problem solving oriented at education and the development of Science and Technology. Problem solving skills, reasoning, and form the personality of each student are the basics expected to be achieved through this lesson. To reach that competence, the lecturer has to describe the learning activities in the lesson plan by considering the level of student's way of thinking.

Learning strategy course is expected to give the experience for students about learning strategy. The students are required to understand and solve the problem in learning. Besides, this course is expected to shape the way of thinking of students in comprehending a concept or understanding through reasoning in relation between the definition of emerging theories. The students will be well trained in solving the problems faced through the given examples.

In learning strategy course, it covers some aspects of materials in agricultural technology education as the preparation for deeper learning of Science and Technology especially in the learning strategy. The materials taught in this course are: learning system, learning models, the principles of media, and learning resources. By this material, the students are expected to have an experience in implementing the lesson, and it can support

the success of students to develop their potential.

## 2. Methodology

The type of this research is a classroom action research that includes the stages of implementation such as: planning, action, evaluation and reflection. This research was conducted on the college students of Agricultural Technology Study Program 2013/2014 with total population 44 students. The objective of this research is the increasing of student learning outcomes that can be achieved after the learning process completed.

In the preparation stage, several things need to be prepared, namely: (1) a request for permission; (2) Observation to get a preliminary data of teaching and learning activity especially learning strategies; (3) Problem Identification in the implementation of learning process that had been done. After identification, the implementation of cycle was then conducted. The sample was the first semester students of Agricultural Technology Study Program. The type of data obtained from the sample are: (1) qualitative data - data from observation; and (2) quantitative data - data from learning outcomes scores.

## 3. Result and Discussion

### The Result of Research

The data result and analysis of this research is based on collected data about students' learning outcomes on Learning Strategy course through *cooperative learning type- Group Investigation* conducted on Engineering Faculty, State University of Makassar. This research was conducted for two cycles and data analyses were done on the result of pretest and posttest for the 1<sup>st</sup> and 2<sup>nd</sup> cycle. The data were complemented with the change of students' behavior based on the observation during research.

In the pretest, the percentages of students' passing grade were described as follow: 36,36% or 16 students from total population 44 students were classified into "complete" category, while 63,64% or 28 students from total population 44 students were

classified into “incomplete” category. These percentages show that there were 16 students who were in incomplete category and they need further improvement in the 1<sup>st</sup> cycle.

The percentages of students’ passing grade in the 1<sup>st</sup> cycle show improvement. From total population 44 students, 70,46% or 21 students were classified into “complete category, while 29,54% or 13 students were on “incomplete” category. Based on criteria of success in which 75% of students’ percentage should complete their learning process, so the 1<sup>st</sup> cycle should be continued to the next cycle. The result of 1<sup>st</sup> cycle was considered incomplete because it was only 70,46% from the population who was in “complete” category. Therefore, re-planning and reflection should be done in order to improve the result in next cycle.

Based on qualitative analysis taken from observation sheet in the 1<sup>st</sup> cycle, students’ percentages for each activity could be described as follow: The percentages for their attendance and participation were 95,45% and 53,97%. The percentage of students who asked their lecturers to accomplish their assignments and those who did their assignment were 20,45% and 94,45%. In addition, the percentage of students who asked about the material that had not been understood was 20,45%, while for the students who did other activities when teaching learning process or doing assignment was 28,40%. Based on this analysis, there are several problems that should be reflected in order to achieve better improvement in the second cycle.

The students’ outcome result on the 2<sup>nd</sup> cycle after the improvement shows that from the total population 44 students, the percentage of students who are in complete category were 95,45% or about 42 students. There was only 4,55% or 2 students classified into incomplete category. Based on criteria of success in which 75% of students’ percentage should complete their learning process, this research is not necessary to be continued in next cycle because 95,45% of students had already fulfilled the criteria.

Besides the improvement of students results during this research from the 1<sup>st</sup> cycle to

the 2<sup>nd</sup> cycle, there were also several changing in the 2<sup>nd</sup> cycle such as: (1) From the result of the study, the attendance of the student was increased, it shown by the attendance of the students in the 1<sup>st</sup> cycle was 95,45% and it increases in 2<sup>nd</sup> cycle to be 98,29%. This happens due to students was exciting toward this learning model. (2) The participation of the students in group works was also increased, which in 1<sup>st</sup> cycle the percentage of the students’ participation was 53,97% and increases in 2<sup>nd</sup> cycle to be 59,09%. This might be happened because of the students’ awareness of the corporation in the group work, where by having the corporation they can finished the homework that given by the teacher. (3) The students who asked for the teacher’s mentoring was decreased which it shown by the percentage of the 1<sup>st</sup> cycle was 20,45% and it decreased to be 15,34% in 2<sup>nd</sup> cycle. This happens due to the corporation of the students when working in group about the topic that will be investigated. (4) The students who did the task was increased, it can be seen in 1<sup>st</sup> cycle the percentage was 95,45% and it increases in the 2<sup>nd</sup> cycle to be 98,29%. This happens because of the student’s awareness that doing the task was a must of every students besides it also can increases their ability and it became an indicator used by the teacher when doing the judgment. (5) The frequency of the students’ participation in asking the teacher about the unclear materials was decreased, this shown by the percentage of the 1<sup>st</sup> cycle was 20,45% decreased to be 17,67% in the 2<sup>nd</sup> cycle. The students’ awareness of paying attention in the teaching and learning process was an important indicator that caused this result. (6) The students who did another activity during the learning process also when did the task was decreased, it is seen by the percentage of the 1<sup>st</sup> cycle was 28,48% and decreased to be 25,06% in 2<sup>nd</sup> cycle. It caused by the students felt lose if they did not paying attention to the teacher explanation and habitually did the task by the corporation of the group members as the result their attention toward the learning process increased.

#### 4. Discussion

From the observation result that had been conducted for two cycles, *Group Investigation* (GI) has given many changing for students such as: (1) the students are more motivated to learn (2) the students are enthusiastic with the implemented model, (3) the students are closer to their classmate (4) the students are motivated to do their assignment, (5) the Students' attention during teaching learning process is increased.

Basically, in the 1<sup>st</sup> meeting there were problems during teaching learning process in which the students had no courage to ask or even did not actively participate in group activity. But these problems can be solved at the end of 1<sup>st</sup> cycle in which there was a better improvement. The Students showed their motivation in asking questions and their attention in performing was improved so that they could perform the task.

In the 1<sup>st</sup> cycle, the students who were active in group activity had improved in the 2<sup>nd</sup> cycle. This was because every student had his/her own task when the group was doing topic investigation. There was corporation among the students in group and interaction when the students reported their investigation result to the other group about the topic that had been chosen.

On the 1<sup>st</sup> cycle, the number of students who participated in another activity whether in teaching learning process or doing their task was decreased. This was because students actively performed their task in investigating their chosen topic given by their group. Therefore, there was no time for them to do another activity besides doing the task in the group.

The students learning outcomes has increased in which their mastery level that has been achieved by using *Group Investigation*. Their learning outcomes has improved after passing learning experience using Group investigation model measured by several tests.

Based on the criteria of success, the students can be classified into complete category if 75% of students' percentage can

complete their learning process. The result of students' learning process from the 1<sup>st</sup> and the 2<sup>nd</sup> cycle of this research had improved and fulfilled the criteria of success given by the ministry of national education.

#### Conclusion

Based on the results of data analysis and discussion, it can be concluded that the implementation of Group Investigation (GI) can improve the learning outcomes of Agricultural Technology Study Program students, Faculty of Engineering, State University of Makassar. Besides, it can improve the students' participation towards their learning process and social relationships between members or groups.

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