



The Effect of the Group Investigation Learning Model Assisted by Digital Mind Map (GI-DMM) on the Learning Outcomes Students in the Affective Domain

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Abstract

The learning process carried out by teachers does not actively involve students, this is because the learning models and media applied by teachers have not been implemented optimally. Based on these problems, the right solution is needed by applying a learning model that can activate students. One of them is by applying the Group Investigation learning model assisted by Digital Mind Map (GI-DMM). The aim of the research was to find out the effect the Group Investigation model learning assisted by Digital Mind Map (GI-DMM) to the learning outcomes of students' affective domains. This research method is a true experiment with a Randomized Control Group Posttest Only Design research design. The population in this study were all of class X IPA. Sampling was carried out by purposive sampling technique by means of a lot system, experimental class and control class. The research instrument for the affective domain was in the form of observation sheets for students' attitudes during the learning process. Data analysis techniques used hypothesis testing (t-test). The results of the study in the affective domain of the experimental class obtained an average value of 93.00 and that of the control class was 88.53. Thus it can be concluded that through the application of the Digital Mind Map-assisted Group Investigation Model (GI-DMM) it can improve learning outcomes in the affective domain of students.

Keywords: affective domain; experimental research; GI-DMM learning model; learning outcomes

INTRODUCTION

The learning process is a process in which there are interactive activities between teachers and students who communicate with each other and take place in educative situations to achieve optimal learning outcomes (Rahmah, 2018; Prasetya *et al.*, 2021; Husna *et al.*, 2023). Learning outcomes are things that cannot be separated from teaching and learning activities in the learning process. Learning outcomes have an important role in the learning process because they will provide information to teachers about the progress of students in an effort to achieve learning goals through the learning process (Siregar, 2019; Wicaksono & Iswan, 2019; Afza *et al.*, 2022). A student's learning outcomes are usually expressed in numbers and can then be described. Learning success is largely determined by students' affective conditions. Students who have an interest in learning and a positive attitude towards subjects will feel

happy studying these subjects, so that students will be able to achieve optimal learning outcomes (Warti, 2018;Junaidi, 2019; Rahman, 2021).

The learning outcomes of the affective domain are judgments based on feelings (likes or dislikes),emotions, attitudes/ degrees associated with a person's tendency to act in response to something or an object (Nurhidayati & Sunarsih, 2013; Magdalena *et al.*, 2021; Yulianto, 2021). There are five ways that can be used to make an assessment in the affective domain, namely: a) Observation, is to record or pay attention to each student's behavior towards a stimulus that is in the learning process, for example books , props, pictures, events, etc.; b) Interview, namely by giving open or closed questions to students. Answers that arise from students can be analyzed further to determine the state of student affection while participating in the learning process; c) Questionnaire or questionnaire, namely a set of questions or statements that have provided a choice of answers; d) Projectile techniques, namely giving assignments that students have never known. Students are asked to discuss and provide interpretations of the task; e) Covert measurement, is an observation of the attitudes and behavior of students and students who are being observed do not know that they are being observed (Nurhidayati & Sunarsih, 2013; Kusumawati, 2015; Hasanah, 2021).

Learning outcomes are the main measure in evaluating a student's success during the learning process. Several factors that influence student learning processes and outcomes. First, there are internal factors that come from within the students, which include psychological conditions, mental skills, and internal encouragement. These factors include the level of intelligence, interest, attention, aptitude, motives, and the level of maturity of students. Furthermore, there are external factors related to the environment around students. This includes how parents educate and support students, the level of understanding of family members, and the relationships between family members that can affect student learning outcomes (Ma'rifah, 2018; Yessa & Marna, 2022; Husna *et al.*, 2023). Facts in the field show that the learning process applied has not been carried out optimally which has resulted in low student learning outcomes in the affective domain. During the discussion, most of the passive students only received results from group mates who had high learning abilities without understanding the material being studied. Therefore, it is necessary to change the learning process through the application of learning models that make students more active and creative which makes students more responsible, cooperative and disciplined during discussions. One of them is by applying the Group Investigation learning model assisted by Digital Mind Map (GI-DMM). The Group Investigation (GI) learning model that has an emphasis on student participation and activities to find out the material itself or everything regarding the subject matter to be studeied and has advantages, one of which is increasing cooperative learning and training students to be accountable for the answers given (Aryana, 2019; Pratami, Suhartono, & Salimi, 2019; Devi *et al.*, 2021; Mahesa *et al.*, 2023). Digital Mind Map (DMM) is a Mind Map designed with a computer program or smartphone application or through a website that acts as a tool to stimulate activity, creativity and collaboration between students and increase their confidence in contributing ideas in class (Pratami *et al.*, 2019;Normawati, 2020; Rosba, 2021). Group Investigation learning model obtained the result that the application of the Group Investigation (GI) cooperative learning model can improve student learning outcomes in the affective, cognitive and psychomotor domains (Dewi *et al.*, 2015; Sagita *et al.*, 2018; Widyaningsih & Puspasari, 2021).

Based on the problems that have been described, a solution is needed to improve student learning success, one solution is to use a learning model accompanied by effective, innovative, creative, and student-centered learning media. The learning model used must be in accordance with the learning objectives, materials, time, student conditions, as well as supporting facilities and infrastructure (Yusuf, 2017; Asyafah, 2019; Saepul *et al.*, 2023). Through several research results on learning models, it was found that a learning model that was suitable to be applied was the Group Investigation learning model assisted by Digital Mind Map (GI-DMM). This research aims to determine the effect of the Group Investigation learning model assisted by Digital Mind Map (GI-DMM) on student learning outcomes in the affective domain.

METHODS

This research method is a true experiment with a Randomized Control Group Posttest Only Design research design because the experimental class uses a Group Investigation learning model based on Digital Mind Map (GI-DMM) and a scientific approach control class then ends with a final test for both classes (Sugiyono, 2005; Asyafah, 2019; Rosba, 202). The population in this study was all class X IPA. In this research, a purposive sampling technique was used, namely taking sample classes based on certain considerations (Sugiyono, 2005). Students' affective domain learning outcomes are measured through affective domain instruments via observation sheets using a Likert scale. The data analysis technique used the t test. The affective assessment instruments and rubrics in the experimental class can be seen in attachment.

$$\text{Value} = \frac{\text{Gain score}}{\text{Maximun score}} \times 100\%$$

According Minister of Education and Culture 2014 the following criteria are used 86-100 as very good, 71-85 as good, 56-70 as enough, and \leq as less.

RESULTS AND DISCUSSION

Based on the research conducted, the affective assessment was obtained from three indicators, namely responsibility, collaboration and discipline. The average affective assessment of the experimental class was 93,00 and that of the control class was 88,53. Research data can be seen in Table 1.

Table 1. Average Affective Domain Indicators for the Sample Class

Indicators	Control Class	Experimental Class
Responsibility	87,76	93,49
Collaboration	89,06	94,79
Discipline	88,80	90,89
Average	88,53	93,00

Based on table 1, the average affective domain learning outcomes in the experimental class are higher than the control class. The affective mean score for the indicator of responsibility for the experimental class was 93,49, for collaboration was 94,79 and discipline was 90,89 while for the control class for indicators for responsibility was 87,76, for collaboration was 89,06 and for discipline was 88,80. The results of hypothesis testing (t-test) the application of the Group Investigation (GI) learning model can improve student learning outcomes in the affective domain of class X IPA. Affective assessment is obtained from an attitude observation assessment, where there are three assessment indicators in the affective domain, namely responsibility, cooperation and discipline. There is a responsible attitude of learning with the Group Investigation (GI) model, students are directed to understand a problem by finding as much information as possible related to the topic that has been determined, so that students are responsible for each task given. Learning prioritizes the participation of its students in discovering for themselves the subject matter studied through various available sources, so that students are responsible for each task they are working on (Primarinda *et al.*, 2012; Dewi *et al.*, 2015; Devi *et al.*, 2021).

In the indicator of working together in experimental class groups by applying the Group Investigation model assisted by Digital Mind Map (GI-DMM) students are actively involved in gathering

information from various sources when conducting investigations. Group Investigation model can train students to cultivate the ability to think independently and active student involvement can be seen starting from the first stage to the final stage of learning (Astutik *et al.*, 2017; Rahmawati, Bektiarso, & Subiki, 2020; Devi *et al.*, 2021). Furthermore, the cooperative attitude was evident when students actively participated in presentations and discussions, and worked together to check the results of group discussions. When compiling a report, all group members present the results of their respective investigations from various sources, and then these results are analyzed together to form one group report. When presenting the report, all group members seemed to coordinate well according to their respective tasks that had been planned. The Group Investigation learning model does not only require the development of individual student abilities, but also encourages them to share knowledge with their group members (Ulfa & Sugianto, 2015; Astutik *et al.*, 2017; Sagita & Kusmariyatni, 2018). Besides that, direct exploring will help students to find new experience and ease them to write it as scientific article (Saputri & Pertiwi, 2021; Fatonah *et al.*, 2023; Putri *et al.*, 2023).

The next indicator is discipline, which is seen in the experimental class by applying the Group Investigation model assisted by the Digital Mind Map (GI-DMM) is the discipline of students in attending class on time, which has been well implemented. During the process of investigating, compiling reports, and making conclusions such as the Digital Mind Map, students show discipline in adhering to the set time to complete all the assignments given. Discipline is very important for every student, because the discipline that is formed will help attitudes, behavior and an orderly way of life that make students successful when studying (Sukmanasa, 2016; Sugiarto *et al.*, 2019; Putra *et al.*, 2020). This discipline is also influenced by the high level of responsibility and cooperation within the group (Sukmanasa, 2016; Tarigan, 2018; Christiani & Martha, 2021). In the control class, even though students were present in class on time, during the learning process, it was seen that there were still students who were less orderly in the group, for example walking around to other groups so that the discussion results were not finished according to the allotted time. This was also seen when they submitted reports on discussion results that were not timely. Discipline of learning has an important role, because it aims to maintain behavior so that it does not deviate and avoid distractions in the learning process (Tarigan, 2018; Putra *et al.*, 2020; Christiani & Martha, 2021).

In the control class with a scientific approach, it can be seen that the average value of responsibility is lower than that of the experimental class. It is very important for students to have a responsible attitude at school because a sense of responsibility will raise motivation and interest in studying at school (Suprihatin, 2015; Rahman, 2021; Yulita *et al.*, 2021). However, this can be seen from the lack of involvement of students when reading textbooks, so the questions they ask are not in accordance with the material being studied. In addition, when making discussion reports, students tend to make reports individually without referring to or combining the results of discussions with other group members. This shows that students' learning motivation is lacking in the learning process, motivation is very important in the learning process (Emda, 2018; Aryana, 2019; Wicaksono & Iswan, 2019). On the other hand, in terms of collaborating, it can be seen that students from the control class were active in making questions, but there were still many questions that were not in accordance with the learning topic. When looking for answers, students tend to rely on friends who have high motivation, so that cooperation in finding answers becomes less. In searching for and processing data from various sources, only a few group members played an active role, while contributions in checking the results of group discussions were also lacking. If a group has good cohesiveness, the discussion and learning results will be better. Good cooperation can stimulate individuals to contribute more to their groups (Rohmah & Winaryati, 2019; Wahyu *et al.*, 2021; Cahyaningtyas *et al.*, 2023).

CONCLUSION

Based on the results of the research that has been carried out, it can be concluded that the application of the Group Investigation learning model assisted by Digital Mind Map (GI-DMM) can

improve student learning outcomes in the affective domain. The average affective value of the responsibility indicator in the experimental class was 93.49, collaboration was 94.79 and discipline was 90.89, while in the control class the responsibility indicator was 87.76, collaboration was 89.06 and discipline was 88.80. So the overall average score in the experimental class is 93.00 and the control class is 88.53. These findings are useful for the nation especially teachers, because this research can be used as an alternative to vary learning models in a wider range, in order to improve other abilities.

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