META-ANALYSIS OF THE EFFECT OF THE COOPERATIVE TYPE INVESTIGATION GROUP MODEL ON STUDENT'S COMPETENCE IN PHYSICS LEARNING

THESIS

By :

RIZKI ANISA TANJUNG

NIM. 17033048/2017

PHYSICS EDUCATION STUDY PROGRAM

DEPARTMENT OF PHYSICS

FACULTY OF MATHEMATICS AND NATURAL SCIENCES

PADANG STATE UNIVERSITY

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P*roposed as one of the requirements for obtaining a Bachelor of Education degree*

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UNDERGRADUATE THESIS APROVAL

Tittle	:	Meta-Analysis Of The Effect Of The Cooperative Type Investigation Group Model On Student's Competence In Physics Learning
Name	:	Rizki Anisa Tanjung
Student ID	:	17033048
Study Program	:	Physics Education
Department	:	Physics
Faculty	:	Mathematics and Natural Science

Padang, 22 November 2021

Knowing:
Head of Physics Department

Dr. Ratnawulan, M.Si
NIP. 196901201993032002

Approved by:
Advisor

Prof. Dr. Festiyed, M.S.
NIP. 196312071987032001

VALIDATION OF UNDERGRADUATE THESIS EXAMINATION

Name	: Rizki Anisa Tanjung
Student ID	: 17033048
Study Program	: Physics Education
Department	: Pyhsics
Faculty	: Mathematics and Natural Science

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It was declarate that she had passed after being defended in front of the undergraduate thesis examiner team for the Department of Physics Education, Faculty of Mathematics and Natural Science, Universitas Negeri Padang

Padang, 22 November 2021

The Undergraduate Thesis Examiner Team

		Name	Signature
Chairman	:	Prof. Dr. Festiyed, M.S	.....
Member	:	Dr. Desnita, M.Si	.....
Member	:	Wahyuni Satria Dewi, S.Pd., M.Pd	.....

AFFIDAVIT

With this letter, i declare that :

1. My paper, the final project in the form of a thesis with this title "Meta Analysis of the Effect of Cooperative Type Investigation Group Model on Student's Competence in Physics Learning" is purely my own work.
2. This paper is purely my ideas, formulations, and research without the help of other parties except the supervisor.
3. In this work, no work or opinion has been written or published by others, unless it is clearly stated in writing as a reference in the manuscript by mentioning the author and listed in the literature.
4. I make this statement in the truth and if there are any irregularities in this statement, I am willing to accept academic sanctions in the form of revocation of the degree that has been obtained because of this paper, as well as other sanctions in accordance with applicable legal norms and provisions.

Padang, November 22nd 2021

Statement Maker

Rizki Anisa Tanjung

ABSTRACT

Rizki Anisa Tanjung. 2021. " Meta Analysis of the Effect of Cooperative Type Group Investigation (GI) Model on Student's Competence in Physics Learning "

Education is one of the foundations in advancing a nation and state. Various efforts in improving the quality of education are by choosing the right learning model. The Group Investigation (GI) model is very actively used to improve learning because it can provide more learning control than other learning models. The first real condition that researchers found was that the learning model implemented in schools was still conventional. The second real condition found by researchers is that the learning outcomes of students are still low. students' conceptual knowledge is also low. and students only memorize concepts. This study aims to determine the effect size of the influence of the group investigation (gi) type cooperative model on student competence in physics learning based on class level, subject matter units, and student competencies.

The meta-analysis research method is a descriptive research method that is to analyze the results of previous research. The meta-analysis research method will use effect size analysis techniques. This meta-analysis method will involve the activities of collecting, processing, and presenting data systematically and objectively to test research hypotheses by conducting investigations into researches by conducting existing research by outlining and examining parts of each study. The results of this effect size calculation will be interpreted to answer the hypothesis of the gap in the results of the relevant research.

The results of the study revealed that the application of the group investigation (gi) type cooperative model had an effective effect on the class X and XI levels. The application of the group investigation (gi) type cooperative model also has an effective effect on four units of Physics learning materials namely : quantity and measurement, mechanics, fluids, and electricity. However, the application of this group investigation (gi) type cooperative model has no effective effect on the units of temperature and heat matter. Finally, the application of this group investigation (gi) type cooperative model has proven effective in increasing student competence in the cognitive, affective, and psychomotor realms.

Keywords : *Meta Analysis, Cooperative Group Investigation Type Model, Student's Competence, Physics Learning*

FOREWORD

Praise and gratitude the author expresses to Allah Almighty, for His mercy and gift so that the author can complete this thesis. The title of this thesis is "Meta-Analysis of the Effect of Cooperative Type Group Investigation Type Model on Student ‘s Competence in Physics Learning". Shalawat and greetings may always be poured out to the Prophet Muhammad SAW. This thesis was prepared to meet one of the requirements in obtaining a Bachelor of Education degree in the Physics Education study program, Faculty of Mathematics and Natural Sciences (FMIPA) Padang State University (UNP).

During the preparation of this thesis, there has been a lot of advice that the author has obtained both guidance, motivation, criticism, and suggestions that are useful for the author. For this reason, the author expresses his gratitude and appreciation to the honorable:

1. Mrs. Prof. Dr. Festiyed. M.S., as an Academic Advisory lecturer and Thesis Supervisor who has guided and motivated the author in completing this thesis.
2. Mrs. Dr. Desnita. M.Si., and Wahyuni Satria Dewi. S.Pd. M.Pd., as the Examining Team who have provided input. criticism. and suggestions in completing this thesis.
3. Mrs. Dr. Hj. Ratnawulan. M.Si., as the Head of the Physics Department of FMIPA UNP.
4. Mr. and Mrs. Teaching staff and employees of the Department of Physics FMI PA UNP.
5. Parents and families who have provided moral and material support to the author.

6. Friends and all parties who have assisted in the completion of this thesis.
7. For the author,Rizki Anisa Tanjung. Thank you for working hard and being willing to hold on to the end. A lot of things have made the mental down, but still try to get it done well. Passion for the next challenge. Man Jadda Wa Jadda.

May the help and guidance that has been given be a shaleh charity for Mr. and Mrs. and get a double reply from Allah Subhanahu Wata'ala. The author realizes that this thesis still has shortcomings and weaknesses that the author cannot find at this time, for this reason, the author expects suggestions in improving this thesis. Hopefully, this thesis will be useful for all readers.

Padang, November 22nd 2021

Writer

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CHAPTER I

INTRODUCTION

A. The Background of Problem

Education is one of the foundations in advancing a nation and state. The better the quality of education in a country, the better the quality of society and the nation. Based on Law No. 20 of 2003 article 3 concerning the National Education System, the purpose of national education is to develop the potential of students to become human beings who have faith and piety in God Almighty, have a noble character, are healthy, knowledgeable, capable, creative, independent, and become democratic citizens, and are responsible for facing a better future.

Various efforts in improving the quality of education. including by improving the curriculum, developing learning tools, improving educational facilities and infrastructure, improving the quality of teachers, improving learning outcomes, developing a student learning outcome assessment system, and so on. Improving the quality of education requires improving the teaching and learning process (PBM). This improvement in the teaching and learning process (PBM) will produce students who have the desired quality.

The real conditions obtained after conducting the analysis indicate the existence of a gap between the real conditions in the field and the ideal conditions. The first real condition found is that the learning model implemented in schools is still conventional which results in students feeling bored ((Diana,2018); (Rosmeidani, 2014); (Agustina, 2019); (Henok, 2016)). Teacher-centered conventional learning

where the teacher has a dominant role in every learning process((Rio Mahera, 2020); (Nurul, 2015); (I wayan Santyasa, 2018); (Fahruroji, 2016)). The learning method used is still the lecture and assignment method ((Derlin, 2016); (Khairul, 2014); (Juniper, 2019)) as a result, students become disentient during the learning process (Evitamala, 2016).

The second real condition found is that student learning outcomes are still low because students think that physics is difficult so that the desire to take physics lessons tends to decrease (Umaiya, 2018). Students' conceptual knowledge is also low because there are several indicators that conceptual knowledge has not been achieved (Juniper, 2019). Students only memorize concepts so that they are less able to use these concepts if they encounter problems that exist in everyday life (Henok Siagian, 2016) and to change students' views from wrong concepts to scientific concepts is also usually quite difficult (Siti Masita, 2015).

The gap that occurs between real conditions and ideal conditions requires a solution that is able to overcome the gap. The solution to the problems previously presented is to apply a cooperative model of the group investigation (gi) type in the physics learning process. Various research results show that the application of cooperative type group investigation (gi) model will have an influence on student competence.

This GI (Group Investigation) type of cooperative learning was chosen because it is able to improve student competence. According to Slavin (2009) states that GI is a type of cooperative learning setting, students work in a small group using cooperative inquiry, group discussions, planning and cooperative projects, then students will

present their findings throughout the class. Then according to Sharan (2009) states that GI learning is very actively used to improve learning because it can provide more learning control than other learning models.

Research on learning using a cooperative model of the group investigation (gi) type has been carried out by many previous researchers. The results of the search conducted by researchers on educational articles related to the effect of the cooperative type group investigation (gi) model have varied influences that are only limited to one subject matter and one student competence. Based on this reason, a summary is needed that can make it easier to take data sources or be used as a reference for students who want to find the effect of cooperative type group investigation (gi) model on student's competence using the meta-analysis method.

This meta-analysis research will collect research on relevant topics. Then the existing data is processed and used to make statistical conclusions. The data can be expressed by various measures (effect size) that are calculated or searched first by formulas expressed in various mathematical equations that are closely related to the purpose of the meta-analysis research carried out.

Meta-analysis research was also chosen as a method in this study for several reasons. First, previous research only covered certain educational activities. Second, previous research only discussed one subject matter. Third, previous studies have only determined the influence on certain skills or cognitive learning outcomes.

This meta-analysis research can answer the question of gaps in the results of various research results. This meta-analysis research will provide a big picture of the effect of cooperative type group investigation (gi) model on its bound variables.

Therefore, this study is entitled "Meta-Analysis of the Effect of Cooperative Type Group Investigation (GI) Model on Student's Competence in Physics Learning".

B. Problem Identification

Based on the background of the problems that have been stated, the researcher identifies the problems in the study as follows:

1. The learning model used is still conventional.
2. Students' cognitive learning outcomes and student skills are still relatively low.
3. Previous research has a narrow scope.
4. The amount of research on the the effect of cooperative type group investigation (GI) model on student's competence in Physics learning has not been thoroughly summarized.
5. There has been no comprehensive study of the effect size of the effect of cooperative type group investigation (GI) model on student's competence in Physics learning based on: Grade level, Subject matter unit, and student competence.

C. Problem Restrictions

Based on the identification of the problem, this research is limited to the research title "Meta Analysis of the Effect of Cooperative Type Group Investigation (GI) Model on Student's Competence in Physics Learning". Based on the proposed title, it is necessary to give the following restrictions, so that this research is more focused:

There has been no comprehensive study of the effect of cooperative type group investigation (GI) model on student's competence in Physics learning based on:

a. Grade level,

b. Subject matter unit, and

c. Student’s competence.

D. Problem Formulation

Based on the limitations of the problems that have been stated, problems can be formulated in this study. The formulation of this research problem was obtained, namely:

1. How does the effect of cooperative type group investigation (gi) model affect students' competence in learning Physics based on grade level?
2. How does the effect of cooperative type group investigation (gi) model affect students' competence in learning Physics based on the unit of subject matter?
3. How does the effect of cooperative type group investigation (gi) model affect students' competence in learning Physics based on student’s competence?

E. Research Objectives

Based on the formulation of the problems that have been described, the objectives of this study are as follows:

1. Determining the effect size of the effect of cooperative type group investigation (gi) model on student’s competence in physics learning based on grade level,
2. Determining the effect size of the effect of cooperative type group investigation (gi) model on student’s competence in physics learning based on the unit of subject matter, and
3. Determining the effect size of the effect of cooperative type group investigation (gi) model on student’s competence in physics learning based on student’s competence.

F. Research Benefits

This research is expected to be useful for various parties, namely:

1. For researchers, as the basic capital to develop abilities in the field of research, to increase knowledge, and to be qualified to carry out a thesis in Physics education FMIPA UNP.
2. For educators, as a consideration in determining the right learning model to improve student competence so that the educational goals expected of students are achieved. This group investigation type cooperative model is able to improve the understanding of student concepts and train student cooperation so that for increasing student competence is very possible.
3. For other researchers, as a source of ideas and references for further research in choosing relevant research in determining the influence of certain learning models on student competence in physics learning.

CHAPTER II

THEORITICAL STUDIES

A. Meta-analysis

Meta-analysis according to Glass (1981) is a quantitative analysis and uses a fairly large amount of data and applies statistical methods by practicing it in organizing a number of information derived from a large sample whose function is to complement other purposes. Meanwhile, according to Borg (1983) meta-analysis is the most recent development technique to help researchers find consistency or inconsistency in the assessment of cross-results from similar research results. Meanwhile, Barbora (2009) concluded that meta-analysis according to Sutrisno, et al (2007) is a technique used to summarize various research results quantitatively by looking for effect size values. So meta-analysis is a technique aimed at re-analyzing the primary data from the results of the study to determine the value of the effect size by looking for the difference between the average of the experimental class and the average control class, then divided by the standard deviation of the control class.

Meta-analysis involves the activities of collecting, processing, and presenting data systematically and objectively to solve problems or test a research hypothesis by conducting investigations into existing researches by outlining and examining parts of each study. The steps in conducting a meta-analysis according to Glass in Sutrisno (2007) are as follows:

1. Establish a research theme, Select the type of publication to collect.
2. Collect research results or literature.
3. Record research data (variables).

4. Calculate the size effect per source or research.
5. Interpretaion the summary and create a report.

These studies are usually categorized by individual journals, sample size, control groups, experimental groups, and several other categories. Meta-analysis research is simpler and includes an analysis of a number of research results in similar problems by summarizing the results of the research quantitatively. The objectives of the meta-analysis research according to Higgins (2003) are as follows, namely:

1. Increase statistical strength for primary research results.
2. To obtain a set of effect sizes. namely the strength of the relationship or the magnitude of the difference between variables.
3. Addressing the uncertainty or controversy of some research results.

The research that I conducted aims to obtain a set of effect size. namely the strength of the relationship or the magnitude of the difference between variables. To obtain the setimation of effect size, researchers collected various statistical data in 35 journals with relevant topics, namely a group investigation (GI) type cooperative model. Then it was coded according to the categories needed in my research, After calculating the effect size, researchers can draw conclusions that this group investigation (GI) type cooperative model is very feasible to be implemented in physics learning.

Meta-analysis research also has several functions. According to Retnawati H., et al (2018) stated the functions of meta-analysis, namely:

1. Identify the heterogeneity of influences on various kinds of research and if possible, conclusions can be drawn.
2. Improves statistical power and precision to detect influences.
3. Develop, refine, and test hypotheses.
4. Reduce the subjectivity of research comparisons by using systematic procedures and explicit comparisons.
5. Identify data gaps between basic knowledge and lead to further research.
6. Determine the sample size for subsequent research.

Researchers calculate statistical strength by calculating the effect size of the influence of group investigation (gi) type cooperative models on physics learning by collecting various studies and identifying data gaps between basic knowledge and will finally test research hypotheses to obtain conclusions.

This meta-analysis research has its advantages, The advantages of meta-analysis according to King & Jun He (2006) include:

1. Meta analysis allows combining a wide variety of research results in a quantitative way.
2. Able to describe the relationship between studies well so that they can overcome differences in the results between studies.
3. Meta-analysis is more objective because it focuses on data whereas other literature reviews (such as narrative methods) focus on the conclusions of a wide variety of studies.
4. Meta analysis focuses on effect size.
5. Meta-analysis is carried out quantitatively, so it is easier to do.

In addition to the advantages, meta-analysis research also has its drawbacks. The shortcomings of meta-analysis research according to Retnawati, et al. (2018) are:

1. It takes longer to complete than conventional qualitative research reviews,
2. There is a bias in sampling and publication because the data used tends to be published data that has significant data, while insignificant data tends not to be published,
3. Studies used in meta-analysis are not comparable, and
4. There are methodological errors, Errors in determining the conclusions of a study may occur due to errors of a methodological nature, To overcome this, researchers should use data and statistics consisting of effect size, sample size, moderator variable, or others.

a. Effect Size

Effect size is a measure of the magnitude of the effect of a variable on another variable, the magnitude of the difference and the relationship, which is free from the influence of the magnitude of the sample (Olejnik S, 2003). The related variables are usually response variables, or also called independent variables and outcome variables, or often called dependent variables. Effect size can also be considered as a measure of the meaningfulness of research results on a practical level. Effect size has a quantitative index that is used to summarize the results of the study in the meta-analysis. So, the effect size reflects the magnitude of the relationship between depending on the type of data used in the study in each study.

This effect size has two different ways of use so that it has different ways of interpretation. The first way, the researcher first determines the magnitude of the effect size that is considered meaningful before the study is carried out. Then, the magnitude of this effect size will determine the size of the sample that will be used to be able to produce a minimum effect size as large as it considers meaningful. The researcher then takes a research sample of a predetermined amount in the hope of obtaining an effect size as large as he considers meaningful. The second way of use is post hoc. Effect size is calculated after statistical signification is performed. The effect size obtained will show the estimated effect size in the population as a result of the study. This effect size was later reported as an effect size in research (Huck, 2008).

b. *Summary Effect Size*

In meta-analysis research. the calculation of the effect size is the beginning to determine the next analysis. To test this hypothesis requires at least three more analysis processes namely: 1). Determining the average of weighted effects, 2). Determining confidence intervals, and 3). Testing signification. These three steps of analysis are referred to as summary effect size. In calculating the summary effect size, two analysis models are usually used, namely the fixed effect model and the random effect model. In the fixed effect model, it is assumed that there is only one true effect size and the difference is caused by sampling errors, while in the random effect model it is assumed that the true effect size varies from one study to another.

c. Heterogeneity Test

The use of this heterogeneity test only applies to the use of random effect models. This is because the true effect size value varies from one study to another. These tested research domains should look heterogeneous. The null hypothesis (H0) in the heterogeneous test is that the true effect size between studies is the same, while the alternative hypothesis (Ha) is true effect between studies is different.

B. Cooperative Model

Cooperative learning according to Anitah W (2009) in (Hayati, 2017) is learning that uses small groups so that students work together to maximize their learning activities and their group members. Cooperative learning is a learning model by inviting students to learn and work in small groups of four to five students heterogeneously. The implementation of cooperative learning is not only teacher-centered, students can also learn with other fellow students. Cooperative learning is a learning model that invites learners to be actively involved in learning activities that work in small heterogeneous groups.

Peer teaching is able to provide a space for students to learn while developing collaborative abilities. Learners learn to support each other with group members. because the learning success of learners depends on the success of the group. Learning is considered complete if all group members are able to absorb and understand the learning material designed by the teacher in the classroom. This success will improve the quality of the learning process and outcomes of students.

According to Nurdyansyah (2016) this cooperative learning has several objectives, including:

1. Helping learners to achieve optimal learning outcomes and develop the social skills of learners.
2. Teaches the skills of working together and collaboration.
3. Empowering upper group learners as peer tutors for the lower group.

The use of this cooperative model according to Jarolimek and Parker (1993) in having the advantages obtained in cooperative learning is:

1. Positive interdependence.
2. The existence of recognition in respoming individual differences.
3. Students are involved in classroom management planning.
4. The atmosphere of the classroom is relaxed and pleasant.
5. The establishment of a warm and friendly relationship between students and teachers.
6. Have many opportunities to express pleasant emotional experiences.

In addition. Hayati (2017) stated the weaknesses of cooperative learning, namely:

1. It takes quite a long time for learners to work in teams.
2. It requires practice so that students get used to learning in a team.
3. The cooperative learning model applied must be in accordance with the discussion of teaching materials. teaching materials must be selected as well as possible to be in accordance with the mission of cooperative learning.
4. Requires a different format of learning assessment.
5. It requires special abilities for educators to review various techniques for implementing cooperative learning.

C. Cooperative Model of Group Investigation (GI) Type

This group investigation type cooperative model was developed by Shlomo Sharan and Yael Sharan. According to Burns, the planning of organizing classes with a cooperative model of the GI type is that students form their own groups of 2-6 members. Each group is free to choose a subtopic of the discussion material taught, then create or produce a group report. Next, each group presented its report in front of the class to share information on their findings with each other.

Cooperative learning with GI techniques is perfect for fields that require integrated project study activities. It starts from the activities of obtaining, analyzing, synthesizing information in an effort to solve a problem. Akadenic tasks should provide an opportunity for group members to make their contributions. So that activities are not just about getting answers to a question that is factual.

According to Mafune (2005) states that a group investigation type cooperative learning model can be used by teachers to develop creativity between interpersonal and student groups. The cooperative learning model is designed to help the division of responsibility occur when students follow the learning and authority towards the formation of a social human being. The cooperative learning model is seen as an active learning process because students will learn a lot through the process of formation and creation. So students learn a lot and work in groups to share knowledge as well as responsibility.

Assumptions used as a reference in the development of a group investigation type cooperative learning model, namely:

1. Improving students' creativity abilities can be pursued through the development of a creative process towards an awareness and the development of aids that explicitly support creativity,
2. The emotional component is more important than the intellectual, the irrational is more important than the rational, and
3. Increasing the chances of success in solving a problem must first understand the emotional and irrational components (Nurdyansyah 2016).

The steps of the group investigation type cooperative learning model according to Spencer Kagan (2009) are:

1. Identify topics and organize students into research groups by forming groups based on heterogeneity and choosing question topics.
2. Plan a subtopic of issues to be investigated through the agreement of group members.
3. Conduct investigations to collect information, analyze and evaluate data, and reach conclusions.
4. Preparing the final report. The student summarizes the results , and synthesizes the information. The group decides on the content and format of their presentation; group representatives coordinate group work.
5. Presenting the final report. The presentation of the final report is carried out by each representative of the group.
6. Conducting evaluations for higher assessments that emphasize synthesis and conclusions involving teachers and students.

The GI type cooperative model can affect learning outcomes providing opportunities for students to work together and provide opinions so that the learning process does not seem rigid. The GI-type cooperative model also gives group members the opportunity to take part in planning the various dimensions and demands of their projects (Lumbantorua, 2016). The Investigation Group helps students to conduct investigations on a topic systematically and analytically. This is related to student learning outcomes that increase in relation to the objectives of the Group Investigation type of cooperative learning model, namely students can investigate a topic systematically and analytically, deep understanding of a topic carried out through investigation, train students to work cooperatively in solving a problem, and have positive implications for the development of discovery skills and help achieving learning objectives (Limbong, 2017).

D. Student Competencies

The definition of competence according to the Big Dictionary of Indonesian (KBBI) (2002) is the ability, knowledge, authority, and power to decide or determine over something. The definition of competence according to the Ministry of Education and Culture (1994) is a characteristic possessed by an individual and used appropriately in a consistent way to achieve the desired performance. Djojonegoro (1996) gives the meaning of competence as a basic characteristic possessed by an individual that is causally related to assessment standards that are referenced on superior performance or on a job. The basic characteristics of the competence in question are:

1. Motivation (motives), something that consistently becomes the drive, thought out, or desire of a person to later become the cause of the appearance of an action.

2. Trait is a tendency to consistently respond to situations or information received by individuals.
3. Self-concept, behavior, values, traits, which describes the person of an individual.
4. Knowledge (knowledge), expertise possessed by individuals based on information possessed in a certain field.
5. Skills, intelligence or the ability to perform a certain mental or physical activity. Mental skill competence consists of analytical thinking and conceptual thinking.

According to Bloom et al in Arikunto (2005) the cognitive realm consists of six levels or levels consisting of recognition, comprehension, application, analysis, synthesis and evaluation. The affective realm includes views or opinions (opinions), attitudes or values (attitudes, values). The psychomotor realm is related to the words "motor", sensory-motor or perceptual-motor, so the psychomotor realm is related to the work of skills so as to cause its movement of the body or its parts.

In the concept of competency-based training, it is also explained that competence is a combination of skills, knowledge, and attitudes. This competence will give a clear indication of success in development activities, form a development system and can be used to draw up a school job description.

When viewed from some of the understandings above, it can be concluded that competence itself is classified as knowledge, skills, attitudes, and appreciation which must certainly be possessed by students in order to be able to carry out learning.

E. Physics Learning

Physics is a branch of science that examines natural symptoms through a series of scientific processes or activities. These scientific activities include making

observations, formulating problems, making hypotheses, conducting experiments, drawing conclusions and finding theories and concepts. In addition, physics is also obtained based on scientific attitudes that produce products in the form of theories. concepts, and principles (Trianto,2012). Physics according to the Ministry of National Education 2003: 2 is a subject that requires understanding rather than memorization, but is placed on understanding and understanding concepts that are focused on the process of forming knowledge through discovery, presentation of data mathematically and based on certain rules, so that in studying it requires certain rules.

Good physics learning is based on the nature of physics, that is, students need to master the process and understand the products of physics. The products of physics in this case include theories, principles, laws, and others. While the process is the way how these products can be found further in the application of these products in everyday life.

This physics learning aims to equip students with knowledge, understanding, and the ability to develop science and technology. Physics learning must emphasize the concept of physics based on the nature of science which concerns students' products, processes, and scientific attitudes. The rationalization of the 2004 curriculum for physics subjects is as a provider of various learning experiences in improving the understanding of science concepts and processes. It is stated that the subject matter of physics in high schools and ma is a continuation of the subject matter of junior high school physics with an expansion to abstract concepts that are discussed quantitatively analytically (Depdiknas, 2003: 2).

The learning of physics should be in accordance with the nature of physics, so that the concepts contained in physics can be more easily understood. Therefore, it is concluded that physics learning is a process of building knowledge in studying various physical phenomena that occur in the universe which aims to equip students to develop science and technology in accordance with the nature of physics.

F. Relevant Research

The first relevant research is a thesis written by Wilda Widawati (2020) entitled "Meta Analysis of the Effect of Applying a Group Investigation Type Cooperative Learning Model on Mathematical Ability". The research method used is meta-analysis, The variable tied to this study is the mathematical ability of the learners. The results showed that the group investigation type cooperative model has a very large influence based on the results of the effect size calculations that have been carried out on the mathematical abilities of students.

The second relevant research is a journal written by Rhoudatul A, et al (2018) entitled "Meta-Analysis of the Influence of Cooperative Learning Models on Student Physics Learning Outcomes". The research method used is meta-analysis, The variable tied to this study is the learning outcomes of learners. The results showed that the group investigation type cooperative model has a percentage of 20% so that it is located in a very high category compared to other types of cooperative models on student learning outcomes.

The last relevant research is a journal written by Muhammad Khusni Amin (2020) entitled "Meta Analysis of the Effectiveness of Cooperative Learning on Mathematics Learning Achievement". The research method used is meta-analysis.

The variable tied to this study is learning achievement. The results showed that the group investigation type cooperative model had an effect size of 0.64 which was categorized as having a moderate effect on student learning achievement.

Based on relevant research, the research conducted with the title "Meta Analysis of the Effect of Cooperative Type Group Investigation (GI) Model on Student's Competence in Physics Learning" has differences with previous research. The difference lies in the first free variable of this study is a Cooperative Model type Group Investigation (GI). Second, the journal analyzed is a journal that examines the influence of the Group Investigation (GI) type cooperative model at the class X and XI levels. Third, the chosen subject is Physics. Finally, moderator variables as one of the indicators in choosing a journal are grade level, units of subject matter, and student competencies.

G. Thinking Framework

Research in the field of Fiska needs to be carried out continuously, considering the increasingly complex problems that plague the elements of education today. One of the focuses in research related to the established learning model, for example the Cooperative Type Group Investigation (GI) Model. A lot of research on the influence of the Cooperative Type Group Investigation (GI) Model on student's competence has been published in various articles. But so far, there has been no research summarizing a number of such articles. A complete information presentation that contains how significant the effect given by the free variable is, namely the the Cooperative Type Group Investigation (GI) Model on the bound variable, namely student competence.

To answer this problem, it is necessary to have research using the meta-analysis method, in order to determine the overall effect size of various studies based on grade level, subject matter, and the student's competencies. This is the background of the meta-analysis research related to the effect of Cooperative Type Group Investigation (GI) Model on student's competence in physics learning. Based on the above reviews, the thinking framework in this study can be described as follows:

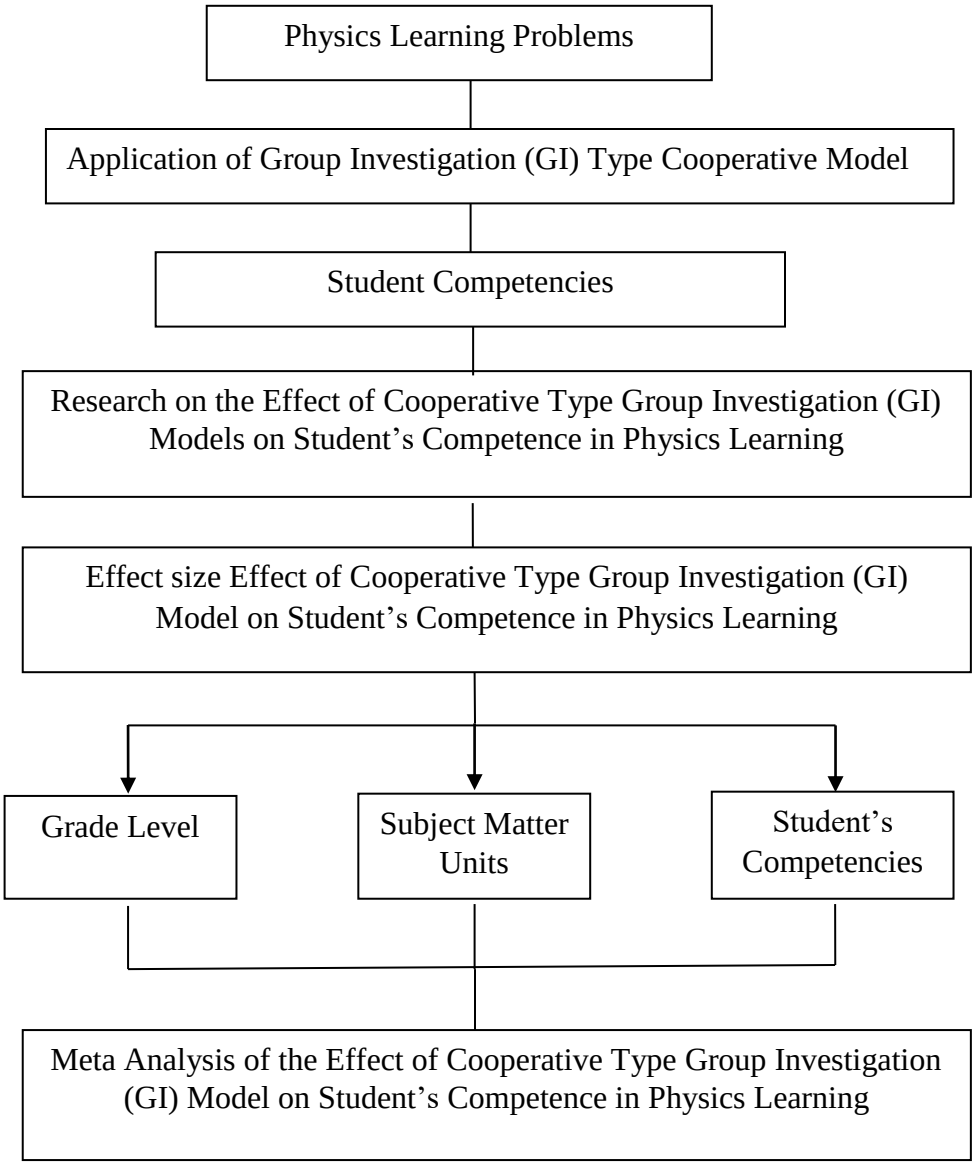

Figure 1. Thinking Framework

CHAPTER V

CONCLUSIONS AND SUGGESTIONS

A. Conclusions

Based on the results of research and discussion of a large meta-analysis of the effect size of the effect of the cooperative type group investigation (gi) model on student's competence in physics learning based on class level, subject matter units, and student competencies, it is explained as follows.

1. There is an effective effect of the cooperative type group investigation (gi) model on student's competence in physics learning based on class X and XI levels.
2. There is an effective effect of the cooperative type group investigation (gi) model on student's competence in physics learning in terms of subject matter units on quantity and measurement materials, mechanics, fluids, and electricity and ineffective on temperature and heat subject matter units.
3. There is an effective effect of the cooperative type group investigation (gi) model on student's competence in physics learning in the cognitive, affective, and psychomotor realms.

B. Suggestions

Based on the conclusions that have been described. the suggestions from researchers for the next relevant research are:

1. This cooperative type group investigation (gi) model has proven effective in increasing student competence in physics learning.
2. The selection of articles should also be done carefully to summarize the research data so that a good effect size calculation can be carried out.

3. Meta-analysis research should be carried out properly and meticulously in calculating the value of the effect size so as to minimize the occurrence of data bias.

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