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The Effectiveness Of The Group Investigation Project Oriented Learning Model In The Internet Programming Course

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Abstract

Based on the preliminary study and needs analysis conducted in the Internet Programming course, it was found that learning outcomes and problem-solving skills in Internet Programming courses were still low, so it was necessary to develop learning models that were relevant to the current learning situation. This study aims to develop a Group Investigation Project Oriented (GIPO) learning model in Internet Programming courses that is valid, effective and practical. This type of research is Research and Development (Research and Development), methods and development procedures apply the ADDIE model. The research finding is that there is a change in attitude, both for educators and students in achieving learning objectives. Attitude change is the main requirement in achieving the success of an innovation. There was an average increase of 11% in the competencies possessed by students, it can be assumed that the Group Investigation Project Oriented (GIPO) learning model is able to simultaneously increase the critical thinking, communication, collaboration, and creativity competencies of students simultaneously. For the Internet Programming course, the Group Investigation Project Oriented (GIPO) model makes it easier for students to understand abstract theories in Internet Programming, so that with an understanding of Internet Programming theory, they can produce reliable programmers who can advance technological developments in Indonesia. it can be assumed that the Group Investigation Project Oriented (GIPO) learning model is able to simultaneously increase the critical thinking, communication, collaboration, and creativity competencies of students. For the Internet Programming course, the Group Investigation Project Oriented (GIPO) model makes it easier for students to understand abstract theories in Internet Programming, so that with an understanding of Internet Programming theory, they can produce reliable programmers who can advance technological developments in Indonesia. it can be assumed that the Group Investigation Project Oriented (GIPO) learning model is able to simultaneously increase the critical thinking, communication, collaboration, and creativity competencies of students. For the Internet Programming course, the Group Investigation Project Oriented (GIPO) model makes it easier for students to understand abstract theories in Internet Programming, so that with an understanding of Internet Programming theory, they can produce reliable programmers who can advance technological developments in Indonesia.

Keywords: Model Group Investigation Oriented Problem, Internet Programming.

INTRODUCTION

The quality of productive human resources has relevance to the welfare of a nation. The essence of the welfare of the nation can be seen from the aspect of good economic growth and the ability of a nation to be competitive with other nations (Ganna, 2013). Productive HR skills are an important concern for organizer higher education in the era technology disruption. Various efforts and strategies are needed to produce competent and competitive human resources through the educational process in higher education institutions (Klaus, 2018). However, at this time, the 4C competencies needed through the process of providing education in Indonesia are College Tall mean to meet the job market in the industrial era 4.0 is still not optimal because it has not been able to maximize the potential of human resources, technology, innovation, and information so that the workforce in Indonesia is still dominated by SDM

with qualification Primary and Secondary education (Gufron, 2019).

Lifters and T schiner (2013) added, the basic principle of Industry 4.0 is the merging of machines, workflows, and systems, by implementing intelligent networks along the production chain and processes to control each other independently. Industry 4.0 as a phase of the technological revolution changes the way activity human beings in the scale, scope, complexity, and transformation of previous life experiences. BPS 2018 data also shows that the number of unemployed coming from Vocational High Schools (SMK) is in the top rank at 9.27%. Next are high school graduates (SMA) at 7.03%, Diploma III (D3) at 6.35%, and universities at 4.98%. One of the causes of the high contribution of vocational education to the number of unemployed in Indonesia is due to the low level of special skills and soft skills possessed.

One of the abilities that students must have in the industrial era 4.0 is language programming, Language programming itself has many types, one of which is Programming Internet. Subject Programming Internet is a subject of expertise that has a major role in the development of information technology (IT),Programming Internet is a science in the field computer software engineering that can support the potential of university graduates to compete in the industrial era 4.0. So that the learning model Programming The internet is very important to be developed in order to provide supplies and skills to college students.

Based on the results of field observations and interviews with the head of the Information Systems study program that the student learning outcomes of the Information Systems Study Program at Lancang Kuning University specifically on MKE compulsory subjects in the last four years, namely the average value of the course students Programming Internet from year to year there is almost no improvement, the value in the category is more than adequate or an average of C. Even though the course is Programming Internet is a core course in the Information Systems Study Program which should have an average score of B or in the good category. The fact that happens that learning Programming Internet is not optimal, this is caused by several factors; 1) learning models and strategies are not right, 2) materials and subjects are too broad and not specific, and 3) the concept of active student learning has not been implemented (StudentCenteredLearning). Therefore, there is a need for new innovations in learning courses Programming Internet, so students can easily understand and apply theory Programming Internet in building an application later.

The author also conducted an evaluation by interviewing the manager, several lecturers and teaching staff of the Information Systems Study Program, the results of the interviews concluded that the average student was still weak in mastering the material, lacked motivation in learning and was not accustomed to learning independently or in groups. Students tend to just accept what the lecturer says, less creativity and there is no good interaction in the learning process. On the same occasion, the author also conducted interviews with several students of the Information Systems Study Program who had taken courses Programming Internet, they argue that materials Programming The internet is very difficult to understand and lack of understanding so that they are not enthusiastic about learning.

The passive and less participatory learning culture of students makes creativity low, innovation does not develop, so it is less critical, weak in solving problems, and not daring in making decisions. They will grow into a workforce that depends on standard work patrons such as robots, they should have the opportunity to grow and develop according to their optimal potential, able to learn independently in accordance with the new learning paradigm, even students should be able to construct their own knowledge obtained from the stimulus provided. received from the environment (Jalinus et al., 2017).

In connection with the implementation of internet programming lectures, research on Project Based Learning and Group Investigation in internet learning is very important. Research on the development of project-based learning models in internet programming courses in the information systems study program is very important to do in the context of implementing learning by applying it to the independent learning campus curriculum.

This research on the development of project-based learning models and group investigations in

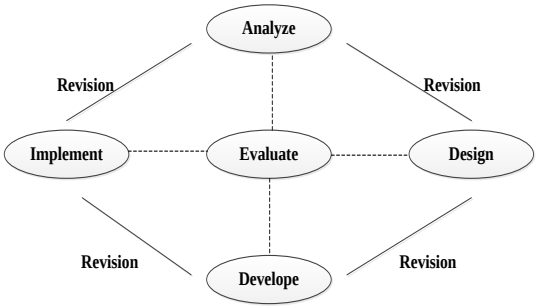
internet programming courses at the Information Systems study program at Lancang Kuning University resulted in the value of newness in learning internet programming. The novelty value generated in this research is an internet programming learning model called the Group Investigation Oriented Project (GIPO). Project-based internet programming learning tools, and significant use of online learning resources in internet programming courses.

Based on the problems above and the results of observations, interviews and field studies that the author did, it is necessary to conduct an in-depth study of improving learning outcomes, especially in the Internet Programming course, Information Systems Study Program. The development of the Group Investigation Project Oriented (GIPO) learning model in the Internet Programming course is deemed suitable to be implemented in universities. This GIPO model is an elaboration between 2 learning models, namely Project Based Learning and Group Investigation models. Therefore, research and development (Research and Development) is an important and absolute thing to do.

METHOD

Based on the study described on the background and the formulation of the problem in this research, the type of research to be carried out is development research or called Research and Development (R&D) with qualitative and quantitative approaches. In the research on the development of the Group Investigation Project Oriented learning model, experimental research methods were applied, namely "research methods used to find the effect of certain treatments on others under controlled conditions" (Sugiyono, 2010: 107). So that it can be seen whether the development of this learning model is good for improving the quality of Internet programming learning.

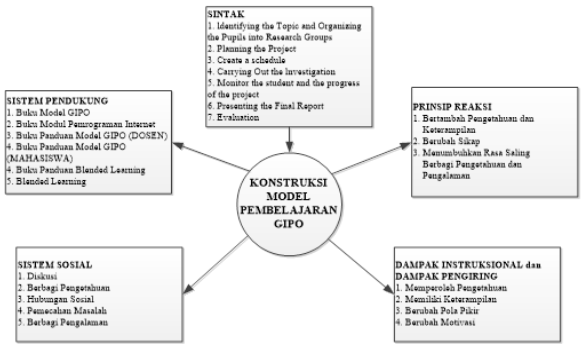
The research and development of the Group Investigation Project Oriented learning model uses the ADDIE model which stands for Analysis, Design, Development or Production, Implementation or Delivery and Evaluations. The development of the model in this study was carried out by following the steps of the ADDIE model described previously. The ADDIE model was chosen because it is in accordance with the situation and conditions of increasing teacher professional competence which requires continuous evaluation in developing a model.



The stages of developing the ADDIE model were adopted from Branch (2002)

At the analysis stage, what must be done is need analysis: Contextual Analysis; and Theory Analysis. Dick, Carey & Carey (2001:10) define context as "…the environment (this could be a classroom setting, a work setting, or the real world), I which the instructional design or system will exist". Context analysis needs to be done because according to Dick, Carey & Carey (2001:10) context analysis ".will help to avoid the pitfill or your instruction occuring in a vacuum and no learning being transferred". Needs analysis is carried out with the aim that the learning model that will be developed can answer the needs needed in the learning process for Internet Programming courses. This is important to do so that the needs of this learning model are in accordance with the needs of educators and students.

In the design phase, a systematic process is carried out to determine goals, plan a strategy, explain how to achieve goals, including the sequence of activities. This phase allows the researcher to prepare a blueprint or frame of reference for the model to be applied.



Construction of the Group Investigation Project Oriented Learning Model in the Internet Programming course

The next stage is development according to Thiagarajan, Semmel, & Semmel (1974:8) explaining that expert validation is "a technique for obtaining suggestions for the improvement of the materials". At this stage, after conducting a Focus Group Discussion (FGD), improvements were made to the Group Investigation Project Oriented learning model in the Internet Programming course that had been developed and validated by experts. In this case, the authors ask for validation by vocational experts, learning design experts and educational technology, Indonesian language experts and information technology experts as validators for this learning model.

Next is the implementation stage by asking the expert to validate the Group Investigation Project Oriented learning model in the Internet Programming course that has been developed and the product in the form of a Group Investigation Project Oriented learning model book in the Internet Programming course, Internet Programming module book, teaching guidebook, Blended guidebook Learning. Sugiyono (2012: 417-418) said that effectiveness testing was carried out to see the "before-after" situation based on the results of the training. At this implementation stage, the researcher went directly to the field to observe the implementation of this model. At this stage, the effectiveness of the learning model was tested using analysis of student learning outcomes based on cognitive, affective, and psychomotor aspects. Student learning outcomes are obtained through testing using questions, which will later be validated for item validation, item reliability, discriminatory power, and level of difficulty. This test was conducted to determine the effectiveness of the questions used to test the learning model for students.

The last stage is an evaluation to see the process of testing the results of the Group Investigation Project Oriented learning model on the Internet Programming course that is being built, and making improvements to things that need to be revised and developed. The model that has been tested and revised is the result of research and development of a model that is valid, practical, and effective.

RESULTS

This study resulted in a Group Investigation Project Oriented Learning model in Internet programming learning at universities. The development of this model uses procedural development stages based on needs analysis so that the problems contained in learning are known. To overcome the problems that have been identified then proposed solutions to help overcome these problems. Before developing the Group Investigation Project Oriented learning model, it is necessary to conduct a curriculum analysis and needs analysis so that the development process can be carried out with optimal results. This analysis is used as a reference in the development stage of this learning model.

To produce a valid learning model, the development stage needs to be based on the components of the learning model. according to Rusman (2012) that the components of the learning model consist of syntax, social systems, reaction principles and support systems. so the development of the GIPO learning model in this study is also based on these 4 components. based on the results of the validity test given by the expert, it can be concluded that the theoretical model of the Group Investigation Project Oriented learning that was developed in the four components of the learning model.

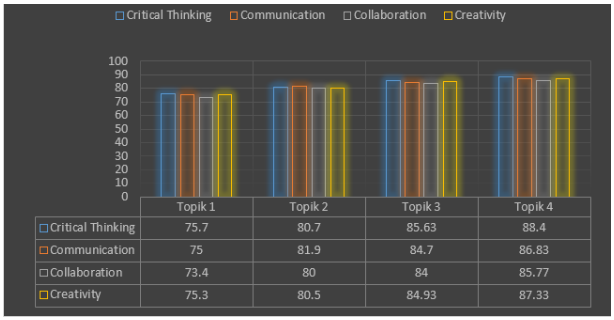
Reigeluth (1999) argues that the most important aspect of effectiveness is to know the degree or degree of application of a theory or model in a given situation. Regarding effectiveness in research. Akker (1999) states that "Effectiveness refers to the extent that the experience and outcomes with the intervention are consistent with intended aims." Effectiveness refers to the degree that the experience and outcomes of the intervention are consistent with the intended goals. From the opinion above, it can be seen that a product is said to be effective if the product is appropriate in its use and utilization.

The effectiveness test is based on the aspect of assessing student learning outcomes, based on

learning assessment data for Internet Programming courses for students of the Information Systems study program at Lancang Kuning University which was achieved after being given a sample test of 15 respondents, obtained a minimum score range of 0 and a maximum of 100. The results of empirical scores shows that the minimum score is 71 and the maximum score is 91.

Based on direct observations on the implementation of the GIPO learning model, student activities began to increase, as seen from the ability to identify a writing problem and collect information asking questions, cooperation, disciplined commitment with responsibility, communication, mutual cooperation, self-confidence and increased interest in learning. Thus it can be said that the application of the Group Investigation Project Oriented learning model can really foster creativity in activities and independence in students, in accordance with the principles of the Group Investigation Project Oriented learning models can provide space for students to be directly involved in finding ways that productively to solve problems, construct and build new knowledge, describe a specific problem in other words that students can understand and conclude a problem and find other patterns to solve a problem. This is in accordance with the explanation of Cole (1995) who said that investigative activities provide the possibility for students to develop understanding through various activities and the results are in accordance with the development that students go through or the process of building understanding independently.

Formative evaluation is carried out by conducting assessments and observing the development of student competencies from 4 topics discussed during 1 semester. Reports of student activities in each learning topic can be described on a graph as follows:



	Topik 1	Topik 2	Topik 3	Topik 4
Critical Thinking	75.7	80.7	85.63	88.4
Communication	75	81.9	84.7	86.83
Collaboration	73.4	80	84	85.77
Creativity	75.3	80.5	84.93	87.33

following: Graph of 21st Century Competency Assessment Using the Group Investigation Project Oriented Model

Based on the graph above, it can be assumed that in each learning topic for one semester there is a significant increase in the competencies possessed by students, it can be assumed that the Group Investigation Project Oriented learning model is able to increase the competence of critical thinking, communication, collaboration, and creativity possessed. students simultaneously. So that with a learning process that is able to improve 4C competencies, students can explore their abilities in the learning process.

CONCLUSIONS

Based on the results of the research and discussion referring to the purpose of this study, it can be concluded that the learning model developed in this study is the Group Investigation Project Oriented learning model in the Internet Programming course. There is a significant difference between the final score of the Experiment class and the control class with the calculated t-test value of 2.818 which is higher than the t-test table of 2.048 and the mean result of the experimental class is 81.10 higher than the average value of the control class at 77. .05 Thus, the Group Investigation Project Oriented learning model developed meets the criteria for effectiveness. There was a significant increase in the competencies possessed by students, it can be assumed that the Group Investigation Project Oriented learning model is able to simultaneously increase the 4C (Critical Thinking, Communication, Collaboration, and Creativity) competencies of the students. So that with a learning process that is able to improve 4C competencies, students can explore their abilities in the learning process.

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