Effectiveness of Learning using the Case Method in Building Drawing Construction Course

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ABSTRACT

Universities play an important role as institutions that form the next generation of the nation who must have the ability to solve problems quickly and precisely. The development of the times and the complexity of the world of work require the adaptation of learning methods that are in accordance with current needs, such as the Independent Learning Independent Campus (MBKM) curriculum. MBKM integrates all courses in higher education to keep up with the times. The Building Engineering Education Study Program, Building Drawing Construction course is the key in preparing students to design buildings. This study uses a classroom action research method with three cycles, each of which includes the stages of planning, implementation, observation, and reflection. The subjects of the study are 13 students in Semester IV of the 2021/2022 academic year. The results of Cycle I showed an average class score of 72.3, indicating the need for follow-up actions to improve students' understanding of the material. In Cycle II, the average class score increased to 75.69 with continued efforts for better learning. Cycle III recorded an average grade of 81.15, showing a significant improvement in student learning outcomes, with most students achieving the good (A-) category. This research illustrates the importance of continuous adaptation of learning methods to improve student learning outcomes in facing future demands and competition.

INTRODUCTION

The rapid development in the field of technology and information has a great impact on the world of education. Education today is very dynamic in the face of competition and fierce challenges. Universities as part of the printing of the nation's next generation must be able to think quickly and accurately in solving every problem and facing competition. Universities are required to be able to produce graduates who can answer the challenges of the world of work in the future. In addition, the challenges and demands in the world of work will also be more and more difficult. Therefore, several learning methods also adjust to the curriculum and existing technological developments. The latest is the Independent Learning Independent Campus (MBKM) curriculum. MBKM is one of the new breakthroughs in the world of Education, especially in Higher Education. All courses in higher education also adjust to the MBKM. In the Building Engineering Education Study Program, Department of Civil Engineering, FT-UNP, there is a Building Drawing Construction course which is one of the groups of Expertise Courses. This course contains materials about soil and its characteristics

as a place to erect buildings, describing shallow foundations (river stones), understanding the construction of reinforced concrete on non-storey buildings, construction of floors and walls of buildings for various materials, drawing the construction of kozen and door leaves, windows, ventilation, drawing the construction of easels and ceilings, describing the construction of roofs and roof trusses and describing pre-planned drawings. So that after studying the Building Drawing Construction Course, students can design a non-multi-storey building.

The case method is discussion-based participatory learning to solve a case or problem. The application of this method will hone and improve critical thinking skills in problem-solving, communication, collaboration, and creativity. Mayer (2002) stated that learning with a case-based method will provide an opportunity for students to first introduce other relevant knowledge domains that are in accordance with the case before problem analysis is carried out. In other words, students must have prior knowledge before this method is applied. The case used is part of a real problem scenario and is relevant to the part of the material learned in the learning activity. Shapiro (1984) in Weil et al. (2001) revealed the main roots in case method-based learning that is useful for facilitating student learning, especially in the context of developing management skills and philosophy in the real world.

METHOD

This study uses the action *research method*, in the implementation of this research is carried out in 3 cycles, each cycle consists of (1) planning stage, (2) action stage (implementation), (3) observation (observation), and (4) reflection stage. The subjects in this class action research are Semester IV students who take the Building Drawing Construction Course of the Building Engineering Education Study Program, State University of Padang for the 2021/2022 Academic Year which totals 13 students. The research data is in the form of quantitative data obtained from the assessment of the results of case solving and discussion activities.

RESULTS AND DISCUSSION

Results of Cycle I 1. In the Planning Stage in the first cycle, the author made and planned the actions of the RPS (Semester Learning Plan) which had been prepared during the Workshop on the Preparation of the RPS *Case Method* of the Department of Civil Engineering in Lubuk Minturun. The research instruments used are learning and assessment instruments. Learning instruments are in the form of syllabus, RPS *case method* and case study materials. Assessment instruments are in the form of student activity observation sheets and analytical ability test questions. The research instruments used have been validated before being used in research. 2. Implementation Stage In this implementation or action stage, the researcher begins by reminding students about learning, dividing students into groups of 3-4 people, and explaining the learning objectives and case-solving scenarios, then sharing the cases that have been prepared. In the core activity, each group identifies facts and concepts in the case, as well as connects various information and solves the case on the task sheet that has been provided. In the closing stage, each group presents a problem-solving, then other groups are welcome to give suggestions and criticism. Based on the results of observations during the implementation of learning at the 2nd to 4th meetings, students are still experiencing adaptation to the case-based learning method applied during lectures. Case analysis activities are carried out by students in groups through problem solving. 3. Observation and Evaluation Stage a. Observation Results of Assessment of Learning Outcomes Through the Case Study Method of Construction and Building Drawing Courses. Based on the assessment sheet carried out

through observation during learning activities in cycle I, the following data were obtained:

Table 1. Results of Student Learning Assessment Cycle I

Number of Students	Highest Scores	Lowest Rate	Average Score
13	75	70	72,3

Results of Student Learning Assessment Cycle I From table 1, the average grade score was 72.3, while the highest score obtained by students was 75 and the lowest score was 70. This shows that in the implementation of Cycle I, further actions are still needed to improve students' ability to understand Building Drawing Construction material.

Analysis and Reflection Stage The first cycle of activities ends with reflection. The implementation of Building Drawing Construction learning through the case method went quite well and consistently in accordance with what was planned in the RPS. At some stages, it is still not well directed and structured due to the learning conditions carried out online (*online*) and various characteristics that students have, students still experience difficulties in determining case solving so that the time/duration required becomes longer than the predetermined lecture schedule.
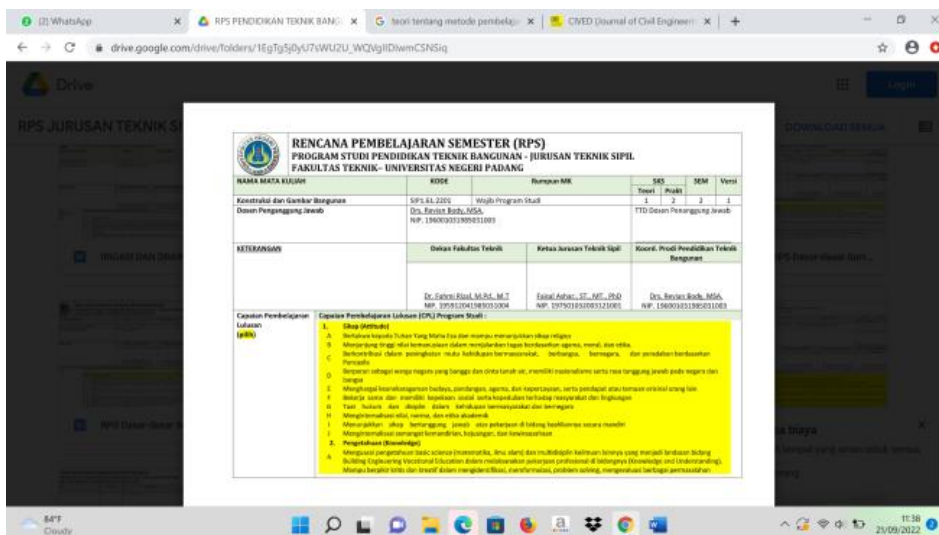

Figure 1. RPS Case Method KGB

Figure 2. Diagram Case Method

Results of Cycle II Research 1. Planning Stage The planning stage is carried out by preparing a Semester Learning Plan (RPS) still using the case method, but the case to be solved is first

prepared and submitted to students before lectures are held. 2. The Lecturer Implementation Stage begins with aperception (strengthening), providing an initial understanding of the learning material associated with the previous material, corrections and affirmation of several things related to learning at the previous meeting. Furthermore, lecturers carry out learning activities in accordance with the steps that have been planned in the RPS. Students were given the opportunity to conduct offline discussions, where lecturers gave each group the opportunity to discuss for approximately 30 minutes to continue solving cases that had been carried out previously. The next 30 minutes continued with discussions and presentations from the presenting group related to the case that had been presented. 3. Observation and Evaluation Stage a. Results of Observation of Learning Assessment Through the Case Study Method of the Building Drawing Construction Course Based on the assessment sheet carried out through observation during lecture activities in the second cycle, the following data were obtained:

Table 2. Results of Student Learning Assessment Cycle II

Number of Students	Highest Scores	Lowest Rate	Average Score
13	78	75	75,69

From table 2 above, it can be seen that based on the results of observation and assessment of learning activities in cycle II based on the assessment sheet, from 13 students obtained an average class score of 75.69, while the highest score obtained by students was 78 and the lowest score was 75. This shows that in the implementation of Cycle II, further actions are still needed to improve students' ability to understand the lecture material provided. 4. Final Analysis and Reflection Stage The second cycle of activities ends with reflection. The implementation of the Building Drawing Construction lecture through the case method went well and consistently in accordance with what was planned in the RPS. Through the implementation of this learning, it is possible to provide opportunities for students to study cases in more depth and understand the lecture material better. So it is necessary to carry out action through the next cycle by providing case examples that are not only limited to text material but also videos. c. Results of Cycle III Research 1.
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Planning Stage In the third cycle at the planning stage, it is carried out by preparing a Semester Learning Plan (RPS) using the case method. The case to be resolved is first prepared and submitted to students before the lecture is carried out not only in the form of text but also video. 2. Implementation Stage The lecturer begins the learning activity with an perception, provides an initial understanding of the learning material associated with the previous material and corrections and affirmations of several things related to learning in the previous meeting. Furthermore, lecturers carry out learning activities in accordance with the steps that have been planned in the RPS. Students were given the opportunity to conduct offline discussions, where lecturers gave opportunities to each group to discuss, followed by discussions and presentations from the presenting groups related to building cases that had been presented in the form of text and video 3. Observation and Evaluation Stage a. Results of Observation of Learning Assessment Through the Case Study Method of Construction and Building Drawing Courses Based on the assessment sheet carried out through observations during learning activities in cycle III, the following data were obtained

Table 3. Results of the Student Learning Assessment Cycle III

Number of Students	Highest Scores	Lowest Rate	Average Score
13	85	80	81,15

From table 3 above, it can be seen that based on the results of observation and assessment of

learning activities in cycle II I based on the assessment sheet, from 13 students obtained an average class score of 81.15, while the highest score obtained by students was 85 and the lowest score was 80. This shows that in the implementation of Cycle III there was an increase in learning outcomes in student learning activities where the average score obtained was categorized as good (A-). 4. Analysis and Reflection Stage Based on the results of observations and assessment results during the lecture process, the implementation of learning through the case-solving method has been very good and implemented according to the RPS, although there are still some obstacles faced by students during online and offline learning, but overall students look enthusiastic and enthusiastic in attending lectures. During the discussion, students are active in expressing opinions or refuting the statements conveyed. Based on the results of the above reflection, it can be concluded that in general, the implementation of learning using the case-solving method that has been carried out is going well. The criteria and conditions for the score are contained in the case study assessment sheet instrument which consists of assessment; (1) the ability to present cases, (2) the ability to identify information, (3) the ability to integrate cases with relevant regulations and policies, (4) the ability to master knowledge during presentations, and (5) *student performance*: attitude, systematic, and communication skills. The increase in students' Construction and Building Course scores can be seen in the Figure 3.
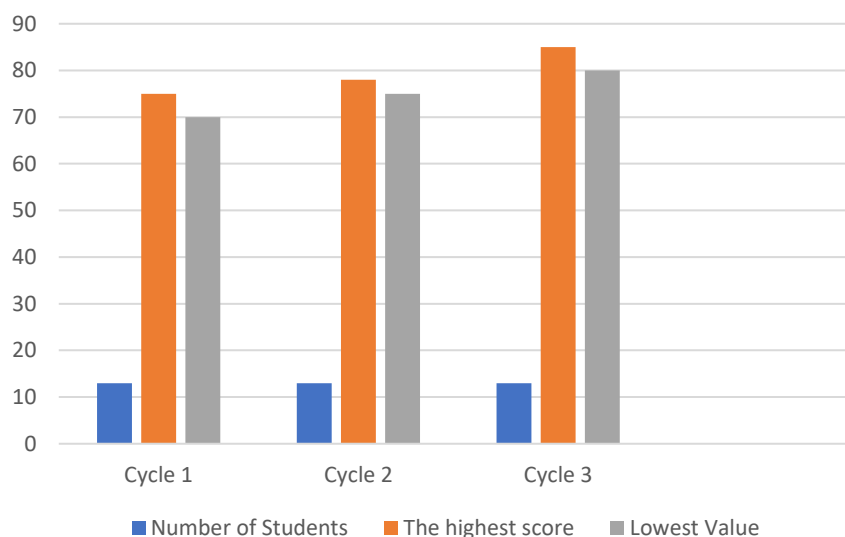

Figure 3. Increasing the value of students' Construction and Building Drawing Courses

CONCLUSION

Based on the results of the research of the actions that have been carried out, it can be concluded that the application of the case-based learning method is effective in increasing the average score of the Building Drawing Construction Course, Building Engineering Education Study Program, Department of Civil Engineering, Faculty of Engineering, Universitas negeri padang (UNP).

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