The Effectiveness of Learning Using Case Method for Building Design Courses

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ABSTRACT
The purpose of this research is to evaluate the effectiveness of implementing learning using the case method. This study used a quantitative approach using 30 students participating in building design courses. The questionnaire used for data collection contains the problems that become case studies, questions related to the problems encountered, factors causing the problems, strategies for solving problems, evaluation of strategies or efforts that have been made, and recommendations for solving problems. The research findings obtained indicate that students are more motivated and active in learning using the case method. Students gain easy understanding of building designs so that they can apply them according to real conditions. The learning method using the case method is very effective in increasing students' understanding and skills in designing buildings.

Keywords: *Building Engineering Education, Case Method, Learning Effectiveness.*

1. INTRODUCTION

Building Engineering Education prepares the nation's next generation, especially to produce prospective teachers in vocational high schools. In addition, it also produces graduates who have competence in the field of civil engineering who have the competence to work in the field of infrastructure and public facilities that are needed by the community. The study program must be able to produce graduates who have good skills and understanding in accordance with the IQF 6 level for bachelors in building engineering. The use of effective learning methods, one of which can use the case method so as to motivate students to be actively involved in learning. In this lesson students are prepared to solve real problems by applying the theories and skills they have learned in learning.

Building design is a field that requires high skills and knowledge in terms of theory and practice. In the current era of digital technology, the use of mobile learning in building design is increasingly popular. Mobile learning or m-learning is a learning method that uses mobile technology such as smartphones, tablets or laptops to allow users to learn flexibly anywhere and anytime.

The goal of this study is to assess how well the case study style of instruction works. The case technique, which has been used for years in teacher education, is still useful and relevant today [1]. The case study learning method is effective in increasing students' conceptual understanding and practical skills. Students also have high motivation in using this method in learning. The case study learning method is effective in improving students' ability to apply technical concepts in real situations. The case study learning method is very effective in increasing conceptual understanding and practical skills. This method also encourages students to be actively involved in learning and provides a more real learning experience. Case method learning can improve learning outcomes, learning interest, and critical thinking skills to find solutions to cases [2,3].

In the case learning method participants role play making decisions according to case situations as if they were real [4]. The implementation of the case method learning has a high level of effectiveness on students' critical thinking skills [5]. Instructor role; student involvement in learning; personal experience in teaching cases in an accounting course; the recommended approach for case-based teaching and several ways to assess/evaluate student performance [6]. The application of smart learning content based on the case method is effectively used [7]. The effectiveness of applying the case method has a high level of entry into

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students' critical thinking skills [5]. There is an increase in learning; high student engagement in classroom learning; and higher learning outcomes. The case method is effective in student learning and engages their minds so that students engage in deeper thinking [8-15].

2. METHOD

This study uses a survey method. Collecting data through a quantitative survey through questionnaires. The population used was 30 S-1 students in Building Engineering Education at the Faculty of Engineering, Universitas Negeri Surabaya who took a building design course. Questionnaires have been developed according to the research objectives to be achieved. Questionnaires were used to obtain information related to increasing students' understanding and skills when participating in case study learning in designing buildings. Data analysis was carried out by analyzing descriptively and inferentially.

3. RESULT AND DISCUSSION

The outcomes of case study learning demonstrate the level of comprehension of students in building design. To describe the efficiency of case study learning for students, this approach combines frequency and percentage with a measure of central tendency (mean), and a measure of variability (standard deviation). Due to the continuous nature of the variables, they are divided into three groups: low (2.10), moderate (2.11-3.55), and tall (3.56–5.00).

Tabel 1. Student understanding level.

Understanding Level	Frequency (n)	Percentage (%)	M	SD
Low	0	0	4.42	73
Moderate	4	13,33		
High	26	86,66		
Total	30	100		

After engaging in case study learning, the student's proficiency level in building design was determined. After all, an average score between 1 and 5 is determined by adding the average values of each variable. Once the average score has been determined, it is divided into three categories: short (2.10), medium (2.11-3.55), and tall (3.56-5.00).

Tabel 2. Student skill level.

Skill Level	Frequency (n)	Percentage (%)	M	SD
Low	0	0	3.95	.82
Moderate	6	20		
High	24	80		
Total	30	100		

The outcomes of the degree of case study learning effectiveness for students learning to design buildings. After all, an average score between 1 and 5 is determined by adding the average values of each variable. Following that, the estimated average score is divided into three groups: low (2.10), middle (2.11-3.55), and tall (3.56-5.00).

Table 3. Case study learning responses

Response Rate	Frequency (n)	Percentage (%)	M	SD
Low	0	0	3.93	.86
Moderate	6	20		
High	24	80		
Total	30	100		

Table 3 shows that the majority of respondents (80%) perceive the case method learning with media showing high-level results and followed by 6 respondents (20%) perceive moderate levels. The results also show that the average lecturer score as a whole is 3.93 (SD = 0.86) which indicates that in general the respondents consider a high level of readiness to apply the case method learning.

Tabel 4. Pearson Correlation Coefficient Relationship between case method learning media, case method learning, and student learning outcomes.

	r	α	Strength of the Relationship
Learning media case method	.663**	.000	High
Case method learning	.783**	.000	High

The findings are presented in Table 4. There is a favourable and statistically significant link between the case method learning media and student learning outcomes ($r = 0.663$, $p = 0.000$). It is determined that the correlation is moderately strong. The results are also provided in Table 4, which demonstrates that there is a positive and statistically significant association between student learning outcomes and the implementation of the case method learning ($r = 0.783$, $p = 0.000$). The intensity of the association between case method learning via media and student learning outcomes is high, according to Guilford's Rule of Thumb.

The effectiveness of learning using the case method has a significant effect on student learning outcomes. Learning using the case method can increase student motivation and encourage students to use technology to design buildings. Implementation of learning using the case method directly affects student learning outcomes.

Learning media used in case method learning can affect student learning outcomes. The findings prove that the need for the importance of applying the case method learning to students. The use of case study learning has a significant effect on student learning outcomes. Learning case studies can improve students' understanding and skills in designing buildings. The application of learning directly also affects student learning outcomes.

This is in line with previous research by [2,3]. The case method is able to contribute to the development of deeper practical and analytical skills in the future specialist according to the specified area. The case method also offers major preparatory programs the opportunity to explore and overcome unfair thinking in lower stakes settings.

5. CONCLUSION

The conclusion obtained from this research is that the case study learning method is effective in increasing students' understanding and skills in designing buildings. The case study learning method can also be used as an effective alternative to improve the quality of learning.

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REFERENCES

[1] T.V. Rasinski, The Case Method Approach in Reading Education, Reading Horizons, 30(1), 1989, pp. 5-14.

[2] S.R. Leggett & K.C. Smith, Using Case Method To Address Equity-Related Gaps In Principal Aspirants' Learning Experiences, Educational Planning, 29(1), 2022, pp. 19–33.

[3] M. Chumak, S. Nekrasov, N. Hrychanyk, V. Prylypko, & V. Mykhalchuk, Applying Case Method in the Training of Future Specialists, Journal of Curriculum and Teaching, 11(1), 2022, pp. 235–244. DOI: https://doi.org/10.5430/jct.v11n1p235

[4] M.R. Dixit, S. Manikutty, S.S. Rao, M.M. Monippally, R. Bijapurkar, G. Raghuram, R.T. Krishnan, S. Mitra, K.R.S. Murthy, J. Joseph, A. Jain, & S.K. Srinivasan, What is the future of the case method in management education in India? Vikalpa, 30(4), 2005, pp. 87–131. DOI: https://doi.org/10.1177/0256090920050408

[5] A. Fauzi, I. Ermiana, N.K. Rosyidah, & M. Sobri, The Effectiveness of Case Method Learning in View of Students' Critical Thinking Ability, Pedagogia : Jurnal Pendidikan, 12(1), 2023, pp. 15–33. DOI: https://doi.org/10.21070/pedagogia.v11i1.1544

[6] A.K. Guess, A Methodology for Case Teaching: Becoming a Guide on The Side, Journal of Accounting and Finance, 14(6), 2014, pp. 113–126.

[7] Haryadi, R. Herliani & H.P. Sitompu, Smart Content Learning Based on Case Methods, The 2nd ICoSDTech 2022, 2022, pp. 161–170.

[8] N. Singh, Enhancing the effectiveness of case study pedagogy by clubbing complementary teaching strategies for better students learning, IOWA: IOWA State University, 2017.

[9] B. Novcic, E. Neskovic, V. Filipovic, & V. Damnjanovic, Traditional Versus Innovative Case Study Teaching Method-Student Perspective, ICERI 2012 Proceedings, 2012, pp. 3497-3503.

[10] P. Sirichotpundit, A Study on Effective of Applying Case Study to Teaching on Advertising and Sales Promotion for Fine and Applied Arts Students in Business Administration Program at Suan Sunandha Rajabhat University.

[11] R. Jamil, Y. Samian, & F. Quoquab, Case Teaching Method: Institutional-Level Experience and Development of Measurement Tool, Advanced Science Letters, 21(7), 2015, pp. 2451-2454. DOI: https://doi.org/10.1166/asl.2015.6304

[12] A.A. Alsalman, The effectiveness of using case-based learning approach: Student perceptions and assessment tools used in accounting case study course, Australian Journal of Basic and Applied Sciences, 11(10), 2017, pp. 26-40.

[13] O.S. Chern, & L.C. Cheeb, Examining the Use of Scaffolding Approach in Teaching Case Study: An Approach Towards Enhancing Students' Critical Thinking and Problem-Solving Skills, Proceeding of the 7th Inspirational Scholar Symposium, 2022, pp. 180-192.

[14] O. Ates, Impact of case study method on an ESP business course, International Journal of Business and Social Science, 3(6) 2012.

[15] M.M. Al-Shammari & D.T.N. Huy, The Case Study Benefits for Teaching Business and Economics Students in Universities and Colleges, Educational Administration: Theory and Practice, 28(4), 2022, pp. 46-60. DOI: https://doi.org/10.17762/kuey.v28i4.455