



Determinant Model of Case Method and Team-Based Project Learning Models Through Collaborative Class Strategies with Off-Campus Partners

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Abstract: Case method and team-based learning are two key performance indicators (KPIs) implemented by the Ministry of Education and Culture Number 3/M/2021. Case-method and team-based projects are learning that is imposed on students to improve students' critical thinking skills, solve problems, find solutions, and develop communication skills. This learning is also helpful for lecturers to improve higher abilities and skills. This research aims to test the Determinant Model for applying the Case Method and Team-Based Project in the Key Performance Indicator (KPI) Achievement Policy for Higher Education. This research used quantitative methods with a survey design. Data collection used a research instrument in the form of a questionnaire, which had been declared valid and reliable. Furthermore, the data collected was analyzed using descriptive and inferential statistics using path analysis techniques. The research concludes that using the case method model in higher education is significantly related to improving the key performance indicators for higher education.

Keywords: case method, team-based project, policy

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INTRODUCTION

Case-method and team-based projects in the learning process are new methods applied in the learning process in higher education. The application of the case method and team-based project is stated in the Decree of the Minister of Education and Culture of the Republic of Indonesia Number 3/M/2021 concerning Key Performance Indicators for State Universities and Higher Education Service Institutions in the Ministry of Education and Culture. Key Performance Indicators (KPIs) aim to improve the quality of education and produce competent graduates to compete in the world of work and industry. Key Performance Indicator Number 7 (KPI-7) includes the case method and team-based project. Applying these two methods aims to improve students' thinking skills and abilities and requires educators to have higher skills.

The application of case methods and team-based projects will vary for each course and each lecturer. This is due to different understanding and critical thinking skills in each individual. The implementation of these two in the department environment also significantly influences the institution's policies in implementing strategies to achieve KPI. The learning methods that must be applied currently refer to the Key Performance Indicator Number 7 (KPI-7), the percentage of undergraduate and diploma courses that use case-solving learning methods (case-method) or project-based group learning (team-based project) as part of the evaluation weight. The case method is discussion-based participatory learning to solve cases or problems. Applying this method will hone and improve critical thinking skills for solving problems, communication skills, collaboration, and creativity (Plessis, 1993; Sato & Rogers, 2010). In implementing the case method, students are not given assignments individually but are done in groups. This is because real-life problems require solving problems together using different perspectives and strategies that group members can propose (Siddiquei, 2022).

This case method includes a type of problem-based learning. Students have the main role in solving problems, while lecturers act as facilitators whose job is to observe, ask questions, and direct discussions (Ermiana, 2022; Korhonen, 2023). The case method has the advantage of actively involving students in developing very high thinking skills, communication, collaboration, and creativity skills (Rosidah & Pramulia, 2021; Williams, 2005). With this method, students are more independent and mature, able to give and receive opinions from others and instill positive social attitudes among students. The weak side of this method is that it requires learning preparation, including tools, problems, and complex concepts; sometimes, it is not easy to search and find relevant problems, and it takes quite a long time (Booth, 2000; Costa, 1988). Obstacles often encountered in the implementation of the case method learning model include: 1) Teachers need much time to prepare material for cases encountered and instructions on how to solve them that students need; 2) Students sometimes become frustrated because the information in the case may be incomplete; 3) Case discussions in class can be scary for some students.

A team-based project is a method built through learning activities and real project-based tasks that provide challenges related to daily life to be solved in groups (Levin, 1995; Seidel & Godfrey, 2005). This learning method can be effectively applied to study programs because the learning process will develop students' abilities to be creative and innovative. If the courses presented in the curriculum are the courses more applicable in everyday life, then applying this learning method will be more effective for students to master. Students will learn a lot about how to apply it in everyday life (Suyatna, 2017; Thomas, 2001). Therefore, this phenomenon needs to be observed and diagnosed to find the main causal factors and then find a solution so that the quality of student learning outcomes can improve and help achieve the Key Performance Indicator Number 7 for Higher Education quickly. Based on ideas supported by data, this research is directed at diagnosing the determining factors (determinants), especially for analyzing the application of the case method and team-based project in achieving the key performance indicators (KPI) for higher education.

METHODS

This research method used quantitative methods with a survey design (Creswell, 2012). Research methods and designs were implemented in research procedures (steps). Next, the data collected was processed/analyzed using descriptive and inferential statistics with path analysis techniques. The design stages of this research are described as follows.

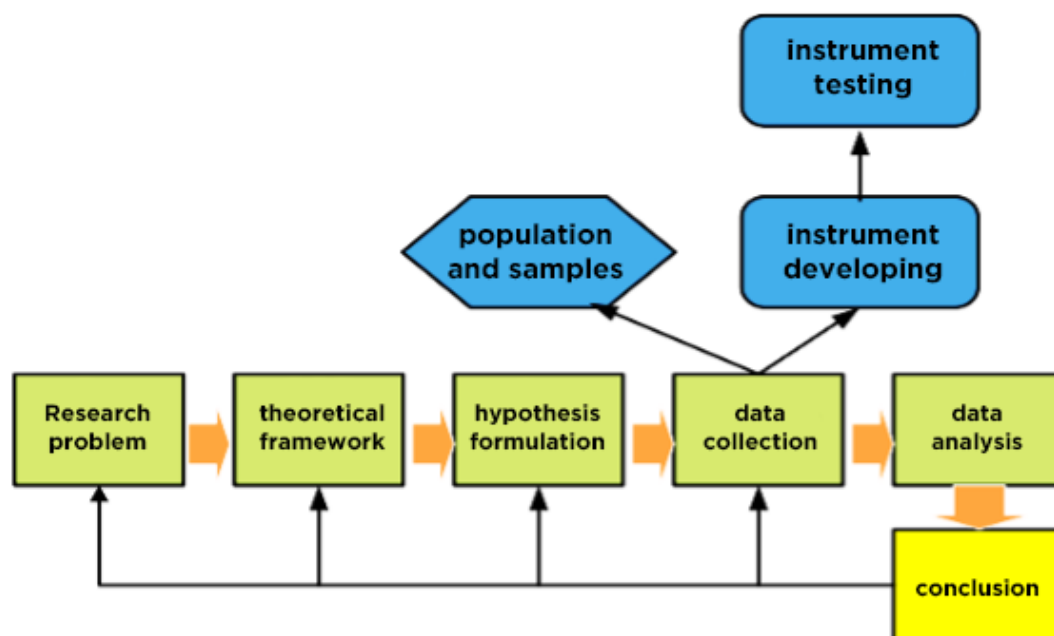


Figure 1. Research Stages

The type of data used in the research was primary data, namely data taken directly from respondents. The analysis technique used was Partial Least Square (PLS) with the following procedure:

1. Structural Model Plan (Inner Model)

$$\eta_1 = \gamma_1 \xi_1 + \zeta_1$$

$$\eta_2 = \beta_1 \eta_1 + \gamma_2 \xi_2 + \zeta_2$$

2. Measurement Model Design (Outer Model)

$$\text{Exogenous Latent Variable 1 (Reflection)} : \xi_1 = \lambda_1 X_1 + \lambda_2 X_2 + \lambda_3 X_3 + \lambda_4 X_4 + \lambda_5 X_5 + \lambda_6 X_6 + \lambda_7 X_7 + \delta_1$$

$$\text{Exogenous Latent Variable 2 (Reflection)} : \xi_2 = \lambda_1 X_1 + \lambda_2 X_2 + \lambda_3 X_3 + \lambda_4 X_4 + \lambda_5 X_5 + \lambda_6 X_6 + \lambda_7 X_7 + \delta_2$$

$$\text{Endogenous Variable 1 (Reflexive)} : \eta_1 = \lambda_1 Y_1 + \lambda_2 Y_2 + \lambda_3 Y_3 + \lambda_4 Y_4 + \lambda_5 Y_5 + \lambda_6 Y_6 + \lambda_7 Y_7 + \lambda_8 Y_8 + \lambda_9 Y_9 + \lambda_{10} Y_{10} + \epsilon_1$$

3. Goodness of Fit Outer Model Formative

4. Goodness of Fit Inner

Descriptive analysis through frequency distribution can provide relative and cumulative information on the research object. Information can be expressed in percentage form (%). The pattern of relationships between variables to be studied is a causal relationship using Structural Equation Modeling (SEM) which is a statistical technique that tests a relatively complex series of relationships simultaneously.

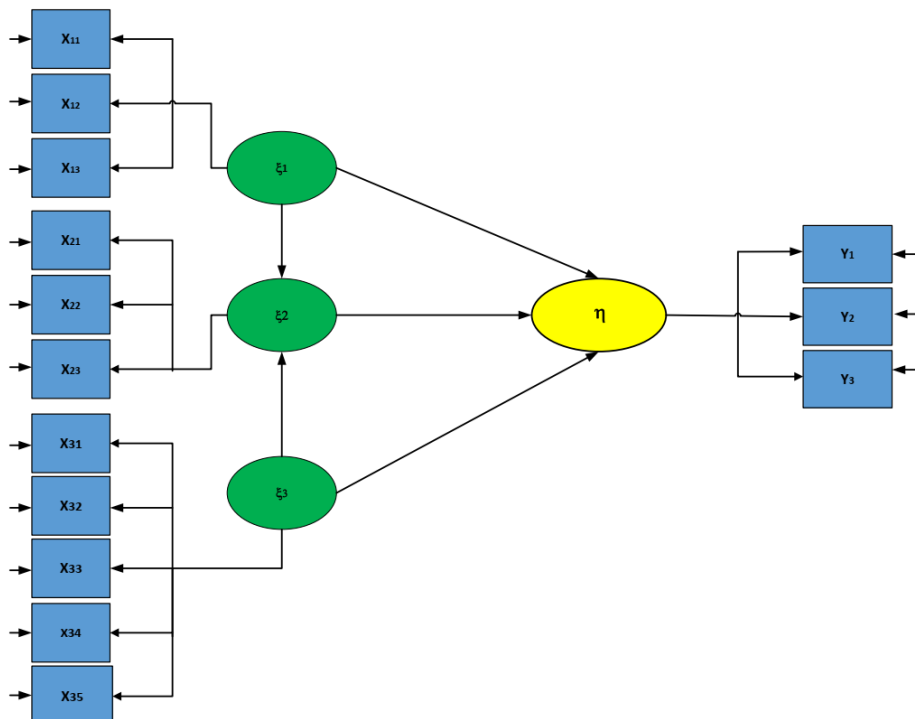


Figure 2. Research Determinant Model

Information:

ξ_1 = **Model Case Method**

X_{11} = Critical Thinking

X_{12} = Communication and Collaboration

X_{13} = Creativity

ξ_2 = **Collaboration Class with Partners**

X_{21} = Guest Lecturer Model

X_{22} = Internship Collaboration Model

X_{23} = Blended Learning

ξ_3 = **Team-Based Project Model**

X_{31} = Project Scope

X_{32} = Team Division Model

X_{33} = Various Project Topics

X_{34} = Project Topic Characteristics

X_{35} = Project Evaluation

η = **KPI Achievement Policy**

Y_1 = Percentage Achievement of Case Method Class

Y_2 = Percentage Achievement of Team-Based Project Class

Y_3 = Percentage Achievement of RPS based on Case Method and Team-Based Project

If the correlation coefficient between the score of an indicator and the total score of all indicators is greater than 0.3 ($r > 0.3$), then the instrument is considered valid, and reliability is checked using Cronbach's alpha coefficient. The purpose of describing each indicator of the research variable is to determine how the respondents' perceptions of these indicators are concentrated and distributed.

Table 1. Respondent's Perceived Goodness Category

Average Score Value	Category
1.00-1.80	Very Not Good
1.81-2.60	Not good
2.61-3.40	Pretty good
3.41-4.20	Good
4.21-5.00	Very good

The results of testing the linearity assumption were carried out using Curve Fit and calculated with the SPSS software.

Table 2. Design of Linearity Assumption Test Results

Relationship Between Variables	Test Results
Model (X1) on (Y1)	
(X2) on (Y1)	
(X3) on (Y1)	
(X1) on (Y2)	
(X2) on (Y2)	

Multivariate normality assumptions were tested with the help of the software AMOS. The multivariate results from the existing data were examined using the Mahalanobis criteria with $p < 0.001$. At this stage, testing was carried out on the model's suitability by reviewing various criteria of goodness of Fit.

Table 3. Design of Test Results of Goodness Of Fit Structural Model

Criteria	Cut-of value	Test Results	Information
X2 Chi-square			
Significant			
Opportunities			
Chi Square/DF			
GFI			
AGFI			
TLI			
CFI			
RMSEA			

Next, interpretation was carried out for further discussion. The complete analysis results were contained in the SEM analysis results. If all the data obtained in the field was input into SEM, the Hypothesis Testing Result Plan that was determined previously were obtained.

Table 4. Design of Direct Effect Hypothesis Testing Results

Hypothesis Number	Relationship Between Variables	Standardize	CR	P
1	Model (X1) on (Y1)	.....	.....	.....
2	.....	.....	.....	.....
3	.....	.....	.....	.....
4	.....	.....	.....	.....

RESULT AND DISCUSSION

Based on the results of validity and reliability testing, it is found that the instrument used to measure the Model Case Method (X1) variable is declared valid based on the value result for each indicator ranging from 0.5 – 0.9 ($r > 0.3$), and the coefficient index value of Cronbach's alpha is 0.871 ($\alpha > 0.6$) so it is said to be reliable. Likewise, the instruments for measuring variables of the collaboration class with partners (X2) and the key performance indicator number 7 (KPI 7) (Y) are said to be valid ($r > 0.3$) where each has a coefficient index value of Cronbach's alpha of 0.942 and 0.870 so it is said to be reliable. Likewise, the instruments for measuring variables of the team-based project model (X3) and the key performance indicator number 7 for higher education (KPI 7) (Y) are said to be valid ($r > 0.3$) where each has a coefficient index value of Cronbach's alpha of 0.8 so it is said to be reliable. The purpose of the description of each indicator of the research variables is to determine the concentration and distribution of respondents' perceptions of these indicators.

Table 5. Respondents' Perception Categories

Average Value	Category
1.00-1.80	Very poor
1.81-2.60	Poor
2.61-3.40	Fair
3.41-4.20	Good
4.21-5.00	Very good

The average score for the case method model (X1) variable is 3.91, which is in the good category. The variable of collaboration class with partners (X2) is in a good category, with a mean score of 4.08. Furthermore, the team-based project model variable obtains a mean of 3.98 in a good category. Likewise, the learning outcome (Y) variable is in a good category, with a mean of 3.92. At this stage, testing is carried out on the model's suitability by reviewing various criteria of goodness of Fit. Here are some plans for the suitability index, cut-off value, and model testing results (Ferdinand, 2002).

Table 6. Results of Structural Model GOF Testing

Indices	Goodness of Fit	Cut off Value	Result	Evaluation
Absolute fit indices	Chi-Square χ^2 (P)	$P > 0.05$	0.000	Not fit
	RMSEA	≤ 0.08	0.14	Not fit
	GFI	> 0.90	0.81	Marginal Fit
	RMR	< 0.08	0.05	Fit
	SRMR	≤ 0.05	0.086	Marginal Fit
Incremental Fit Indices	AGFI	≥ 0.90	0.71	Not fit
	NFI	≥ 0.90	0.88	Fit
	NNFI (TLI)	≥ 0.90	0.88	Marginal Fit
	CFI	≥ 0.90	0.90	Fit
	IFI	≥ 0.90	0.90	Fit
Parsimony fit indices	RFI	≥ 0.90	0.85	Marginal Fit
	PGFI	> 0.50	0.55	Fit
	PNFI	> 0.50	0.69	Fit

In the table above, although several model indices are not yet fit, overall, the GOF index value can be said to be fit because it meets the nine GOF criteria, and for each index, whether absolute, incremental, or parsimony, there is at least one GOF that is fit or fulfilled. Next, interpretation is carried out for further discussion. The complete analysis results are contained in the SEM analysis results. If all the data obtained in the field is input into SEM, the Hypothesis Testing Result Plan that was determined previously will be obtained.

Table 7. Results of Direct Effect Hypothesis Testing

Number of Hypothesis	Relationship between Variables	Standardized	CR	t Value	Conclusion
1	Case-Method Model (X1) on KPI 7 HE (Y1)	0.22	0.77	2.35	Ha is accepted
2	Collaboration class with partners (X2) on KPI 7 HE (Y1)	0.34	0.66	2.40	Ha is accepted
3	Team-Based Project Model (X3) on KPI 7 HE (Y1)	0.32	0.79	3.39	Ha is accepted
4	Case-Method Model (X1) on Collaboration class with partners (X2)	0.47	0.69	5.19	Ha is accepted
5	Team-Based Project Model (X3) on Collaboration class with partners (X2)	0.49	0.71	5.37	Ha is accepted

Based on the hypothesis testing above, the results show that the first hypothesis in the research states that there is a significant influence between the Case Method Model variable on KPI 7 for higher education. Furthermore, the Collaboration Class with Partners variable also significantly influences KPI 7. Likewise, the Team-Based Project Model variable significantly impacts KPI 7. Furthermore, the Collaboration Model with Partners variable is significantly influenced by the Case Method Model and Team-Based Project Model variables.

Furthermore, the indirect influence test is used from several direct influence test results obtained from the product of two or more direct influence coefficients that form it. Based on the theoretical model developed in this research, the results show that the Case Method Model variable indirectly influences student learning outcomes of 0.160 through Collaboration Classes with Partners. Meanwhile, the Team-Based Project Model variable indirectly influences the key performance indicator (KPI 7) variable through the Collaboration Class with Partners variable of 0.167. The analysis results show that the Case Method Model (X1) significantly influences the key performance indicators of higher education (Y), with a calculated t-value of 3.36. The calculated t-value is greater than the t-table (1.96), indicating that this effect is statistically significant. This shows that using the Case Method Model in higher education is significantly related to improving the key performance of higher education. The analysis results show that Collaboration Classes with Partners (X2) significantly influence the key performance indicators of higher education (Y), with a calculated t-value of 2.17. This calculated t-value is greater than the t-table (1.96), which indicates that the effect is statistically significant. This shows that implementing Collaboration Classes with Partners positively correlates with improving the key performance of higher education.

The analysis results show that the Team-Based Project Model (X3) significantly influences the key performance indicator of higher education (Y), even though it has a negative t-value of -2.08. This calculated t-value is absolutely outside the critical value of the two-tailed t-test, which ranges from -1.96 to 1.96. In the context of a two-tailed t-test, a calculated t-value that is outside this range indicates that the test results are statistically significant. In other words, the null hypothesis (H0) is rejected. This concludes that there is a significant influence between the variables using the Team-Based Project Model on the key performance indicators (KPI) of higher education. The analysis results show that the Case Method Model (X1) significantly influences the Collaboration Class with Partners (X2), with a calculated t-value of 5.09. This calculated t-value is much greater than the t-table (1.96), indicating that the effect is statistically significant. This shows that using the Case Method Model is significantly related to implementing Collaboration Classes with Partners. The analysis results show that the Team-Based Project Model (X3) significantly influences the Collaboration Class with Partners (X2), with a calculated t-value of 3.29. This calculated t-value is also greater than the t-table (1.96), indicating that the effect is statistically significant. This shows that using the Team-Based Project Model is also positively related to implementing Collaboration Classes with Partners.

This analysis provides insight into the extent to which each independent variable contributes to the key performance indicators of higher education and how the independent variables relate to each other. In this context, the Case Method Model, Team-Based Project Model, and Collaborative Classes with Partners significantly impact the key performance indicators of higher education. Furthermore, indirect effects are used from several direct influence test results and obtained from the product of two or more direct influence coefficients that form it. Based on the theoretical model developed in this research, the results obtained show that the indirect influence of the case method variable through partner collaboration influences the KPI of 0.153. Meanwhile, the Team-Based Project variable provides influence. The implementation of the case method and team-based project in the learning process are new methods applied in the learning process in higher education. The application of the case method and team-based project is stated in the Decree of the Minister of Education and Culture of the Republic of Indonesia Number 3/M/2021 concerning key performance indicators for State Universities and Higher Education Service Institutions in the Ministry of Education and Culture. Key Performance Indicators (KPIs) aim to improve the quality of education and produce competent graduates to compete in the world of work and industry. Key performance indicator Number 7 (KPI-7) includes the case method and the team-based project. Applying these two methods aims to improve students' thinking skills and abilities and requires educators to have higher skills.

The application of case methods and team-based projects will vary for each course and each lecturer. This is due to different understanding and critical thinking skills in each individual. The implementation of the case method and team-based projects in several study programs at Universitas Negeri Semarang is done by conducting surveys with students. Based on the survey results, it can be stated that the level of student understanding in applying case methods and team-based projects varies. This happens due to several factors, including students' lack of understanding of the implementation steps of the case method and team-based project, not knowing the goals and benefits of the implementation of the case method and team-based project, and still lack of participation in case method or team-based projects. Based on the results of research conducted by [Amin et al. \(2021\)](#), the case method and team-based project learning methods still show low results because lecturers still use the lecture method in the learning process.

The implementation of the case method and team-based project learning aims to improve students' critical thinking and problem-solving skills. According to [Nurazmi et al. \(2020\)](#), characteristics of the case method and team-based project learning include students facing concrete problems, looking for solutions, and working in small groups. In its application, students understand the context and develop other skills, such as communication and critical thinking. [Sahertian et al. \(2022\)](#) state that the application of the case method and

team-based projects is one method that can actually provide opportunities for improving students' skills including creativity, critical thinking, communication, and collaboration. Case method and team-based project learning aim to encourage students to think at a higher level and better understand the learning content (Saputra et al., 2022). Based on the research results, not everyone understands the purpose of implementing case methods and team-based projects for the learning process. Students still consider the assignments given as a burden, not as assignments that will improve their abilities. Another problem is students' lack of understanding due to not finding the right friends in the process of case method and team-based project learning. There is a lack of student understanding of the purpose of implementing case methods and team-based projects because the removal steps in lesson plans are still unclear.

Sahertian et al. (2022) state that in making lesson plans with case methods and team-based projects, lecturers' understanding needs to be improved so that the tasks contained in the lesson plan can be conveyed well to students. Lecturers must have some requirements (Nasir & Maknun, 2022). Each student must participate in case method and team-based project assignments (Rosidah & Pramulia, 2021). It emphasizes that student participation aims to develop student skills, attitudes toward thinking critically, and other abilities. This participation is not only useful in activities that will be done in groups but also useful for students individually because, in the assignment in the case method and team-based project learning will be related to everyday life; in this case, it will train students to be able to have high social attitudes and foster leadership values in the process. There are indications of low student participation in the case method and team-based project assignments because students cannot work in predetermined teams. They tend to want to form their groups and assume that the assignments are only to fulfill assessments.

CONCLUSION

This research concludes that using the Case Method Model in higher education is significantly related to improving the key performance indicators of higher education. Implementing Collaborative Classes with Partners positively correlates with improving the key performance of higher education. There is a significant influence between the Team-Based Project Model variable on the key performance indicators (KPI) of higher education. The use of the Case Method Model is significantly related to the implementation of Collaboration Classes with Partners. The Team-Based Project Model also impacts positively in implementing Collaboration Classes with Partners.

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