

EVALUATION OF THE IMPLEMENTATION OF PROJECT-BASED LEARNING MODELS AND CASE STUDY IN COURSES LEARNING EVALUATION OF THE S1 BUILDING ENGINEERING EDUCATION STUDY PROGRAM

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Abstract

The learning model is a description of the direction and steps in teaching so as not to exceed the material limits and can help students to understand the material given more quickly. Therefore, it is expected that student understanding will improve with a suitable learning model. The learning models that are expected to be applied in lectures are Project Based Learning (PjBL) and Case Study (CS). The purpose of this study was to evaluate the implementation of learning/lectures in the Undergraduate Study Program of Building Engineering Education, Faculty of Engineering Universitas Negeri Surabaya in the Learning Evaluation course. This research is included in the quantitative category of evaluation research by looking at the implementation of PjBL and Case Study learning and evaluating student learning outcomes. The subjects of this study were three groups of learning in the Learning Evaluation course for the Even Semester 2023-2024 Undergraduate Study Program of Building Engineering Education, Faculty of Engineering Universitas Negeri Surabaya. The instruments used were observation sheets and assignments. The observation sheet is used to collect data on the implementation of learning, while the assignment is to obtain data on student learning outcomes. Data analysis was conducted using quantitative narrative descriptive. The results of this study are as follows: (1) PjBL and Case Study are suitable for the Learning Evaluation course with several notes; (2) Student learning outcomes by giving assignments achieved a good average with several notes.

Keywords: Evaluation, Learning Model, PJBL, Case Study.

1. INTRODUCTION

A learning model is a framework that provides a systematic overview for implementing learning to help students learn with specific goals to be achieved. This means that a learning model is a general overview but still focuses on specific goals. This makes the learning model different from a learning model that has implemented learning steps or approaches that are actually broader in scope. The definition above is in line with Glazer's opinion (2001) which states that a learning model is a conceptual framework that describes learning procedures systematically to manage students' learning experiences so that certain desired learning goals can be achieved. According to Trianto (2015) a learning model is a plan or pattern used as a guideline in implementing learning in class or learning in tutorials. Joyce & Weil in Rusman (2018) argue that a learning model is a plan or pattern that can be used to form a curriculum (long-term learning plan), design learning materials, and guide learning in class or in other learning environments. According to Kardi & Nur in Ngalmun (2016) learning models have four special characteristics that distinguish them from strategies, methods, or procedures. These characteristics are that learning models are logical theoretical rationales compiled by

their creators or developers, in the form of a basis for thinking about what and how students will learn (have learning and learning goals to be achieved), and the learning behavior needed so that the model can be implemented successfully, and the learning environment needed so that learning goals can be achieved.

The learning models that are expected to be implemented or carried out by a lecturer are Project Based Learning (PjBL) and Case Study (CS). These two learning models require students to think more critically, creatively, and learn thoroughly. By using these two learning models, students' mindsets will be honed and eventually they will be accustomed to thinking critically, creatively, and learning thoroughly. These two learning models have different syntax. Project Based Learning (PjBL) syntax is prioritized in completing a task/project until it is finished, the steps of which have been given, but if Case Study prioritizes the process of solving a case, the solution can vary greatly according to the ability or wealth of references owned. Although different, it still requires critical, creative thinking, and thorough learning. The ability to think critically, creatively, and thoroughly learn can be known from the learning outcomes, which of course must be in accordance with the demands of the syntax. These learning outcomes can be stated as PjBL or Cases Study learning outcomes, if the syntax of the two models is realized well during learning. Therefore, it is necessary to conduct evaluation research on the implementation of the two learning models.

2. RESEARCH METHODS

This study uses a descriptive research design by outlining or describing the research results for each variable. This research will be conducted at the S1 Building Engineering Education Study Program, FT Unesa, Even Semester 2023-2024. The research steps that will be taken in order to solve this research problem are as follows: 1) Compiling a research proposal; 2) Compiling a semester learning plan/RPS; 3) Compiling learning materials; 4) Compiling instruments; 5) Validating instruments; 6) Tabulating data; 7) Analyzing data; 8) Making a report; 9) Results seminar; and 10) Compiling a final report. The subjects of this study were students of the Building Engineering Education Study Program who took the Learning Evaluation Course in the Even Semester of 2023-2024. The variables in this study were: 1) Implementation of the PjBL and Case Study Learning models; and 2) Learning Outcomes. The data collection technique used in this study was observation to obtain data on the implementation of learning and assignment assessment. The research instrument used was an observation sheet for learning assessment and assignment assessment. The analysis used was a quantitative descriptive analysis with percentages to then be described qualitatively.

3. RESULTS AND DISCUSSION

3.1 Implementation of *Project Based Learning* (PjBL)

PjBL learning in the learning evaluation course is carried out by providing a work project, namely compiling instruments starting from making instrument grids to conducting instrument analysis. This learning has been implemented in the S1 Building Engineering Education study program in the Odd Semester of 2023-2024. The implementation of PjBL

learning begins with the provision of materials using the discussion method. The materials provided with a discussion model and followed by assignments in the form of a continuous project from compiling instrument grids to conducting existing analysis, such as the following: 1) Material for compiling instrument grids; 2) Material for compiling multiple-choice questions; 3) Instrument validity; 4) Instrument reliability; 5) Analysis of the level of difficulty, discrimination, omit, and distractors. The learning process can be described as follows: 1) Introduction by providing an overview of the importance of the material to be given. This introduction can be carried out well by being able to understand all the existing material; 2) The core material is given with an explanation/lecture and discussion model. The provision of material is intended so that students can understand the material well and can do assignments in the form of compiling instrument grid material, compiling multiple-choice questions, calculating instrument validity, reliability, difficulty level, discrimination power, omit, and distractors; and 3) Closing is done by giving assignments in the form of compiling instrument grid material, compiling multiple-choice questions, calculating instrument validity, reliability, difficulty level, discrimination power, omit, and distractors

3.2 Learning Outcomes with *Project Based Learning* (PjBL)

The learning outcomes with PjBL can be described as below:

Results of compiling the instrument grid

The following are the results of students' work in compiling a grid for multiple-choice assessment instruments.

Table 3.1: Table of results of compiling instrument grids (rough)

Kisi-kisi Penyusunan Butir Soal Pilihan Ganda

Memahami Spesifikasi dan Karakteristik Kayu

NO	Indikator	Jumlah butir						Jumlah	
A.	Kognitif	C1	C2	C3	C4	C5	C6		
	1. Menyebutkan kelebihan kayu dan jenis kayu	v						2	1, 2
	2. Menjelaskan klasifikasi kayu		v					2	3, 4
	3. Menentukan sifat-sifat kayu			v				2	5, 6
	4. Menyeleksi ciri kayu				v			2	7, 8
	5. Menganalisis jenis kayu				v			2	9, 10
	6. Memperjelas bagian kayu					v		3	11, 12, 13
	7. Memprediksi pengawetan kayu					v		3	14, 15, 16
	8. Mengkategorikan tekstur kayu						v	2	17, 18
	9. Mengumpulkan arah serat kayu						v	2	19, 20

The grid is still rough with only distribution in cognitive categories, namely C1-C6. The following is a grid that is more by taking into account the level of difficulty which includes difficult, medium, and easy.

Table 3.2: Table of results of compiling instrument grid (details)

Kisi-kisi Penyusunan Butir Soal Pilihan Ganda

Memahami Spesifikasi dan Karakteristik Kayu

No	Indikator	Jumlah Butir Soal																		Jumlah	No. Butir
		C1			C2			C3			C4			C5			C6				
		MU	SE	SU	MU	SE	SU	MU	SE	SU	MU	SE	SU	MU	SE	SU	MU	SE	SU		
A.	Kognitif																				
	1. Menyebutkan kelebihan kayu dan jenis kayu	1	1																	2	1, 2
	2. Menjelaskan klasifikasi kayu					1	1													2	3, 4
	3. Menentukan sifat-sifat kayu							1	1											2	5, 6
	4. Menyeleksi ciri kayu																			2	7, 8
	5. Menganalisis jenis kayu										1	1								2	9, 10
	6. Memperjelas bagian kayu														2	1				3	11, 12, 13
	7. Memprediksi pengawetan kayu														2	1				3	14, 15, 16
	8. Mengkategorikan tekstur kayu																	1	1	2	17, 18
	9. Mengumpulkan arah serat kayu																	2		2	19, 20

Trial results

Table 3.3: Tabulation of trial data results

DATA VALIDITAS (TES PERTAMA)
METODE : Korelasi Spearman (RHO)

Nama : NINDA PUTRI AULIA
NIM : 22050534072
Kelas : PTB C / 2022
Mata Kuliah : EVALUASI BELAJAR

NO	NAMA SISWA	NIS	KELAS	BUTIR SOAL NOMOR																				SKOR TOTAL
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1	Febriyanti Aviva	21132	XI KGSP 1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	19	
2	Jihaan Nabilah	21141	XI KGSP 1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	19	
3	Afriza Prasetya	21108	XI KGSP 1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	19	
4	Affan Akrama	21107	XI KGSP 1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	19	
5	Putri Aurora	21131	XI KGSP 1	1	1	1	0	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	17	
6	Farel Firlana Hasbulloh	21473	XI KGSP 1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	18	
7	Icha Ananda Dheaneta	21138	XI KGSP 1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20	
8	Musrifani	21165	XI KGSP 1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	0	0	0	1	15	
9	Lidwina Nathalie W	21232	XI KGSP 1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	0	1	0	0	11	
10	Musdalifah	31174	XI KGSP 1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20	
11	Diandra Azzahra	12598	XI KGSP 1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	0	15	
12	Lintang Maharani	21146	XI KGSP 1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	0	16	
13	Diva Irfandi	21125	XI KGSP 1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	19	
14	Farid Kurniawan	21125	XI KGSP 1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	18	
15	Nabila Isvina Putri	21167	XI KGSP 1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	18	
16	Fauzhan Aliansyah	21130	XI KGSP 1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	19	
17	Aulya Putri	21136	XI KGSP 2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	19	
18	Fakhratul Azzahro	188279	XI DPIB	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	4
19	Houstin Paradilla	188276	XI DPIB	1	0	0	1	0	1	0	0	1	1	1	1	1	1	0	1	0	0	0	10	
20	Abhipraya Andika	21102	XI GB 1	1	1	1	1	0	1	0	1	1	1	1	1	1	0	1	1	1	1	1	17	

The table above shows the tabulation results of the trial data that are ready for analysis.

a. Analysis results

1) Validity

Table 3.4: Validity analysis results table

DATA VALIDITAS (TES KEDUA)
Metode : Korelasi Spearman (RHO)

BUTIR 1						
NO.	NAMA SISWA	SKOR				
		TES 1	XY	X2	Y2	
1	Febriyanti Aviva	1	19	19	1	361
2	Jihaan Nabillah	1	19	19	1	361
3	Afriza Prasetya	1	19	19	1	361
4	Affan Akrama	1	19	19	1	361
5	Putri Aurora	1	17	17	1	289
6	Farel Firlina Hasbulloh	1	18	18	1	324
7	Jcha Ananda Dheaneta	1	20	20	1	400
8	Musriani	1	15	15	1	225
9	Lidwina Nathalie W	1	11	11	1	121
10	Musdalifah	1	20	20	1	400
11	Diandra Azzahra	0	15	0	0	225
12	Lintang Maharani	1	16	16	1	256
13	Divi Irandi	1	19	19	1	361
14	Farid Kurniawan	1	18	18	1	324
15	Nabila Isvina Putri	1	18	18	1	324
16	Fauzhan Aliansyah	1	19	19	1	361
17	Aulya Putri	1	19	19	1	361
18	Fakhratul Azzahro	0	4	0	0	16
19	Houston Parasilla	1	10	10	1	100
20	Abhipraya Andika	1	17	17	1	289
JUMLAH		18	332	313	18	5820
Korelasi Excel		0,6023				
Korelasi Manual		0,6				
Keputusan		valid				

BUTIR 11						
NO.	NAMA SISWA	SKOR				
		TES 11	XY	X2	Y2	
1	Febriyanti Aviva	1	19	19	1	361
2	Jihaan Nabihlah	1	19	19	1	361
3	Afriza Prasetya	1	19	19	1	361
4	Affan Akrama	1	19	19	1	361
5	Putri Aurora	1	17	17	1	289
6	Farel Filana Hasbulloh	1	18	18	1	324
7	Icha Annada Dheaneta	1	20	20	1	400
8	Musrifani	1	15	15	1	225
9	Lidwina Nathalie W	0	11	0	0	121
10	Musdalifah	1	20	20	1	400
11	Diandra Azzahra	1	15	15	1	225
12	Lintang Maharani	1	16	16	1	256
13	Divia Irfandi	0	19	0	0	361
14	Farid Kurniawan	0	18	0	0	324
15	Nabila Isvina Putri	1	18	18	1	324
16	Fauzhan Aliansyah	1	19	19	1	361
17	Aulya Putri	1	19	19	1	361
18	Fakhriatul Azzahro	0	4	0	0	16
19	Houston Paradilla	1	10	10	1	100
20	Abhipraya Andika	1	17	17	1	289
JUMLAH		16	332	280	16	5820
Korelasi Excel		0,45809				
Korelasi Manual		0,45				
Keputusan		valid				

The table above is the result of the validity analysis for items 1 and 2 of the 20 items that have been tested.

2) Reliability

Table 3.5: Reliability analysis results table

DATA RELIABILITAS
METODE : Korelasi Spearman (RHO)

Nama : NINDA PUTRI AULIA
NIM : 22050534072
Kelas : PTB C
Mata Kuliah : EVALUASI BELAJAR

NO	NAMA SISWA	BUTIR SOAL NOMOR																				GENAP	GANJIL	SKOR TOTAL	BELAH DUA	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				AWAL	AKHIR
1	Febriyanti Aviva	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	10	9	10	9	
2	Jibhan Nabihah	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	9	10	19	10	
3	Afriza Prasetya	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	10	9	19	10	9	
4	Affan Akrama	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	9	10	19	10	9	
5	Putri Aurora	1	1	1	0	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	8	9	17	8	9	
6	Farel Firlana Hasbullah	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	10	8	18	9	9	
7	Icha Ananda Dhaneta	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10	10	20	10	10	
8	Musrifani	1	1	1	0	0	1	1	1	1	1	1	1	1	1	0	0	0	1	8	7	15	8	7		
9	Lidwina Nathalie W	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	5	6	11	8	3		
10	Musdalifah	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10	10	20	10	10	
11	Diandra Azzahra	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	0	0	9	6	15	8	7	
12	Lintang Maharani	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	0	0	9	7	16	9	7	
13	Diva Irfandi	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	10	9	19	10	9	
14	Farid Kurniawan	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	10	8	18	10	8	
15	Nabila Isvina Putri	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	9	9	18	10	9	
16	Fauzhan Aliansyah	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	9	10	19	10	9	
17	Aulya Pate	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	10	9	19	10	9	
18	Fakhriatul Azzahro	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	4	4	1	1	3	3	
19	Houstin Paradilla	0	0	1	0	1	0	0	0	1	1	1	1	1	1	0	0	0	0	6	4	10	5	5	5	
20	Abhrippyra Andika	1	1	1	0	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	9	8	17	8	9	
	JUMLAH	18	18	19	18	16	18	16	18	15	18	16	17	16	15	18	17	16	16	12	15	170	162	332	174	158

1 Ganjil-Genap	
R1/2.1/2	0,7
R11	0,9 karena $\geq 0,6$ (Reliabel)
2 Awal-Akhir	
R1/2.1/2	0,8
R11	0,9 karena $\geq 0,6$ (Reliabel)

The table above is the result of the reliability analysis of 20 items tested with 20 respondents, with results above 0.6 and declared reliable.

3) Difficulty level

Table 3.6: Table of results of difficulty level analysis

TINGKAT KESUKARAN (p)

Nama : NINDA PUTRI AULIA
NIM : 22050534072
Kelas : PTB C / 2022
Mata Kuliah : EVALUASI BELAJAR

NO	NAMA SISWA	BUTIR SOAL NOMOR																				SKOR TOTAL
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1	Febriyanti Aviva	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	19
2	Jihaan Nabillah	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	19
3	Afriza Prasetya	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	19
4	Affan Akrama	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	19
5	Putri Aurora	1	1	1	0	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	17
6	Farel Firlana Hasbullah	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	18
7	Icha Ananda Dheaneta	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20
8	Musrifani	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	15
9	Lidwina Nathalie W	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	0	1	0	0	11
10	Musdalifah	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20
11	Diandra Azzahra	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	15
12	Lintang Maharani	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	0	16
13	Divi Irfandi	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	19
14	Farid Kurniawan	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	18
15	Nabila Irvina Putri	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	18
16	Fauzhan Aliansyah	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	19
17	Aulya Putri	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	19
18	Fakhratul Azzahro	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	4
19	Houstin Paradilla	1	0	0	1	0	1	0	0	1	1	1	1	1	1	0	1	0	0	0	0	10
20	Abhipraya Andika	1	1	1	1	0	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	17
Jumlah		18	18	19	18	16	18	16	18	15	18	16	17	16	15	18	17	16	16	12	15	
P		0,9	0,9	0,95	0,9	0,8	0,9	0,8	0,9	0,75	0,9	0,8	0,85	0,8	0,75	0,9	0,85	0,8	0,8	0,6	0,75	
KISI-KISI		MU	MU	MU	MU	MU	MU	SE	SE	SE	SE	SE	MU	SE	SE	SE	SE	SU	SU	SU	SE	
		S	S	S	S	S	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	

Keterangan :
MU = Mudah
SE = Sedang
SU = Sulit
S = Sesuai
TS = Tidak Sesuai

The table above is the result of the analysis of the level of difficulty of each item from the 20 items tested.

4) Different power

Table 4.7: Table of results of differential power analysis

NO	NAMA SISWA	BUTIR SOAL NOMOR																				SKOR TOTAL
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
7	Icha Ananda Dheaneta	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20
10	Musdalifah	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20
1	Febriyanti Aviva	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	19
2	Jihaan Nabillah	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	19
3	Afriza Prasetya	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	19
4	Affan Akrama	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	19
13	Divi Irfandi	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	19
16	Fauzhan Aliansyah	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	19
17	Aulya Putri	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	19
6	Farel Firlana Hasbullah	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	18
	BA	9	9	9	9	9	9	9	9	9	9	8	9	9	8	8	8	8	9	7	8	
	PA	0,9	0,9	0,9	0,9	0,9	0,9	0,9	0,9	0,9	0,9	0,8	0,9	0,9	0,8	0,8	0,8	0,8	0,9	0,7	0,8	

NO	NAMA SISWA	BUTIR SOAL NOMOR																				SKOR TOTAL
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
14	Farid Kurniawan	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	18
15	Nabila Isvina Putri	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	18
20	Putri Aurora	1	1	1	0	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	17
5	Abhipraya Andika	1	1	1	1	0	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	17
12	Lintang Maharani	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	0	0	16
8	Musrifani	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	1	15
11	Diandra Azzahra	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	0	0	15
9	Lidwina Nathalie W	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	0	1	0	0	1	11
19	Houstin Paradilla	1	0	0	1	0	1	0	0	1	1	1	1	1	0	1	0	0	0	0	0	10
18	Fakhratul Azzahro	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	4
	BB	7	7	8	7	5	7	5	7	5	7	7	6	6	5	8	7	5	5	4	5	
	PB	0,7	0,7	0,8	0,7	0,5	0,7	0,5	0,7	0,5	0,7	0,7	0,6	0,6	0,5	0,8	0,7	0,5	0,5	0,4	0,5	
	D=	0,2	0,2	0,1	0,2	0,4	0,2	0,4	0,2	0,4	0,2	0,1	0,3	0,3	0,3	0	0,1	0,4	0,4	0,3	0,3	
		cukup	cukup	jelek	cukup	baik	cukup	baik	cukup	baik	cukup	jelek	cukup	cukup	cukup	jelek	jelek	baik	baik	cukup	cukup	
		revisi	revisi	revisi	revisi	lanjut	revisi	lanjut	revisi	lanjut	revisi	revisi	revisi	revisi	revisi	revisi	lanjut	lanjut	revisi	revisi		

The table above is the result of the analysis of the discriminatory power of each item from the 20 items tested.

5) Answer pattern

Table 3.8: Results of answer pattern analysis (omit and distractor)

POLA JAWABAN NO 1-10						
POLA JAWABAN PADA BUTIR NOMOR 1						
	a	b	c*	d	Omit	Jumlah Testee
Kelompok atas	0	0	10	0	0	10
kelompok bawah	1	1	8	0	0	10
jumlah	1	1	18	0	0	20
distraktor	0,05	0,05	Kunci	0		
	B	B	TB			
Analisis: 1. P = 0,9 2. D = 0,2 3. Distraktor $\geq 5\%$ pengikut tes yaitu 5% x 20 orang = 1 orang. 4. Omit $\leq 10\%$ pengikut tes yaitu 10% x 20 orang = 2 orang.						
Keterangan : B = Baik TB = Tidak Baik						
POLA JAWABAN PADA BUTIR NOMOR 2						
	a	b	c	d*	Omit	Jumlah Testee
Kelompok atas	0	0	0	10	0	10
kelompok bawah	0	1	1	8	0	10
jumlah	0	1	1	18	0	20
distraktor	0	0,05	0,05	Kunci		
	TB	B	B			
Analisis: 1. P = 0,9 2. D = 0,2 3. Distraktor $\geq 5\%$ pengikut tes yaitu 5% x 20 orang = 1 orang. 4. Omit $\leq 10\%$ pengikut tes yaitu 10% x 20 orang = 2 orang.						
Keterangan : B = Baik TB = Tidak Baik						
POLA JAWABAN PADA BUTIR NOMOR 3						
	a*	b	c	d	Omit	Jumlah Test
Kelompok atas	10	0	0	0	0	10
kelompok bawah	9	1	0	0	0	10
jumlah	19	1	0	0	0	20
distraktor	Kunci	0,05	0	0		
		B	TB	TB		
Analisis: 1. P = 0,95 2. D = 0,1 3. Distraktor $\geq 5\%$ pengikut tes yaitu 5% x 20 orang = 1 orang. 4. Omit $\leq 10\%$ pengikut tes yaitu 10% x 20 orang = 2 orang.						
Keterangan : B = Baik TB = Tidak Baik						
POLA JAWABAN PADA BUTIR NOMOR 4						
	a*	b	c	d	Omit	Jumlah Testee
Kelompok atas	10	0	0	0	0	10
kelompok bawah	8	0	2	0	0	10
jumlah	18	0	2	0	0	20
distraktor	Kunci	0	0,1	0		
		TB	B	TB		
Analisis: 1. P = 0,9 2. D = 0,2 3. Distraktor $\geq 5\%$ pengikut tes yaitu 5% x 20 orang = 1 orang. 4. Omit $\leq 10\%$ pengikut tes yaitu 10% x 20 orang = 2 orang.						
Keterangan : B = Baik TB = Tidak Baik						
POLA JAWABAN PADA BUTIR NOMOR 5						
	a	b	c*	d	Omit	Jumlah Testee
Kelompok atas	0	0	10	0	0	10
kelompok bawah	1	1	6	2	0	10
jumlah	1	1	16	2	0	20
distraktor	0,05	0,05	Kunci	0,1		
	B	B		B		
Analisis: 1. P = 0,8 2. D = 0,4 3. Distraktor $\geq 5\%$ pengikut tes yaitu 5% x 20 orang = 1 orang. 4. Omit $\leq 10\%$ pengikut tes yaitu 10% x 20 orang = 2 orang.						
Keterangan : B = Baik TB = Tidak Baik						
POLA JAWABAN PADA BUTIR NOMOR 6						
	a	b*	c	d	Omit	Jumlah Testee
Kelompok atas	0	10	0	0	0	10
kelompok bawah	2	8	0	0	0	10
jumlah	2	18	0	0	0	20
distraktor	0,1	Kunci	0	0		
	B		TB	TB		
Analisis: 1. P = 0,9 2. D = 0,2 3. Distraktor $\geq 5\%$ pengikut tes yaitu 5% x 20 orang = 1 orang. 4. Omit $\leq 10\%$ pengikut tes yaitu 10% x 20 orang = 2 orang.						
Keterangan : B = Baik TB = Tidak Baik						
POLA JAWABAN PADA BUTIR NOMOR 7						
	a	b	c	d*	Omit	Jumlah Testee
Kelompok atas	0	0	0	10	0	10
kelompok bawah	1	2	1	6	0	10
jumlah	1	2	1	16	0	20
distraktor	0,05	0,1	0,05	Kunci		
	B	B	B			
Analisis: 1. P = 0,8 2. D = 0,4 3. Distraktor $\geq 5\%$ pengikut tes yaitu 5% x 20 orang = 1 orang. 4. Omit $\leq 10\%$ pengikut tes yaitu 10% x 20 orang = 2 orang.						
Keterangan : B = Baik TB = Tidak Baik						
POLA JAWABAN PADA BUTIR NOMOR 8						
	a	b	c	d*	Omit	Jumlah Test
Kelompok atas	0	0	0	10	0	10
kelompok bawah	1	0	1	8	0	10
jumlah	1	0	1	18	0	20
distraktor	0,05	0	0,05	Kunci		
	B	TB	B			
Analisis: 1. P = 0,9 2. D = 0,2 3. Distraktor $\geq 5\%$ pengikut tes yaitu 5% x 20 orang = 1 orang. 4. Omit $\leq 10\%$ pengikut tes yaitu 10% x 20 orang = 2 orang.						
Keterangan : B = Baik TB = Tidak Baik						
POLA JAWABAN PADA BUTIR NOMOR 9						
	a	b	c	d*	Omit	Jumlah Testee
Kelompok atas	0	1	0	9	0	10
kelompok bawah	2	1	1	6	0	10
jumlah	2	2	1	15	0	20
distraktor	0,1	0,1	0,05	Kunci		
	B	B	B			
Analisis: 1. P = 0,75 2. D = 0,3 3. Distraktor $\geq 5\%$ pengikut tes yaitu 5% x 20 orang = 1 orang. 4. Omit $\leq 10\%$ pengikut tes yaitu 10% x 20 orang = 2 orang.						
Keterangan : B = Baik TB = Tidak Baik						
POLA JAWABAN PADA BUTIR NOMOR 10						
	a*	b	c	d	Omit	Jumlah Testee
Kelompok atas	10	0	0	0	0	10
kelompok bawah	8	0	1	1	0	10
jumlah	18	0	1	1	0	20
distraktor	Kunci	0	0,05	0,05		
		TB	B	B		
Analisis: 1. P = 0,9 2. D = 0,2 3. Distraktor $\geq 5\%$ pengikut tes yaitu 5% x 20 orang = 1 orang. 4. Omit $\leq 10\%$ pengikut tes yaitu 10% x 20 orang = 2 orang.						
Keterangan : B = Baik TB = Tidak Baik						

The table above is the result of the analysis of the answer patterns for each item from the 20 items tested.

1. Case Study Learning

Case Study learning in this course is done by providing a case, namely the final determination of a decision on instrument items by considering many factors of analysis results. This *Case Study* produces a decision on determining instrument items in three categories, namely valid, revised, and dropped. Items declared valid have the meaning that the items can be used directly

for data collection, the revised category has the meaning that the instrument items require revision before they can be used to collect data, and the last is the dropped item category which has the meaning that the items must be dropped or cannot be used to collect data.

Learning with *Case Study* is provided using lecture and discussion models, with activity descriptions as follows: 1) Introduction by providing an overview of the importance of the material to be given. This introduction can be carried out well by being able to understand all the existing material; 2) The core material is given with an explanation/lecture and discussion model. The provision of material is intended so that students can understand the material well and can decide and categorize instrument items into three categories, namely valid, revised, and failed; and 3) Closing is done by giving assignments in the form of analysis results of validity, reliability, level of difficulty, discrimination power, and answer patterns.

2. Learning Outcomes with *Case Study Learning*

The learning outcomes with this *Case Study* are the decision-making of instrument items based on several considerations, namely the level of item difficulty, discrimination power, validity, reliability, and answer patterns. The results are as follows

Table 3.9: Results of item decision-making analysis

KESIMPULAN

Nama NINDA PUTRI AULIA

NIM 22050534072

Kelas PTB C

Mata Kuliah : EVALUASI BELAJAR

No. Butir	Validitas		Reliabilitas	Daya beda		Tingkat kesulitan		Distraktor								Omit		Kesimpulan
	Koefisien	Kategori		Indeks	Kategori	Indeks	kategori/kisi	%a	Kategori	%b	Kategori	%c	Kategori	%d	Kategori	%	Kategori	
1	0,6	V	0,9(R)	0,2	C	0,9	MU/S	0,05	B	0,05	baik	kunci	0	TB	0	B	Revisi (Daya Beda, Distraktor d)	
2	0,81	V		0,2	C	0,9	MU/S	0	TB	0,05	B	0,05	B	kunci	0	B	Revisi (Daya Beda, Distraktor a)	
3	0,38	V		0,1	J	0,95	MU/S	kunci	0,05	B	0	TB	0	TB	0	B	Revisi (Daya Beda, Distraktor c,d)	
4	0,51	V		0,2	C	0,9	MU/S	kunci	0	TB	0,1	B	0	TB	0	B	Revisi (Daya Beda, Distraktor b,d)	
5	0,64	V		0,4	B	0,8	MU/S	0,05	B	0,05	B	kunci	0,1	B	0	B	Lanjut tanpa revisi	
6	0,6	V		0,2	C	0,9	MU/TS	0,1	B	kunci	0	TB	0	TB	0	B	Revisi (Daya Beda, Tingkat Kesulitan, Distraktor c,d)	
7	0,58	V		0,4	B	0,8	MU/TS	0,05	B	0,1	B	0,05	B	kunci	0	B	Revisi (Tingkat Kesulitan)	
8	0,81	V		0,2	C	0,9	MU/TS	0,05	B	0	TB	0,05	B	kunci	0	B	Revisi (Daya Beda, Tingkat Kesulitan, Distraktor b,d)	
9	0,55	V		0,4	B	0,75	MU/TS	0,1	B	0,1	B	0,05	B	kunci	0	B	Revisi (Tingkat Kesulitan)	
10	0,77	V		0,2	C	0,9	MU/TS	kunci	0	TB	0,05	B	0,05	B	0	B	Revisi (Daya Beda, Tingkat Kesulitan, Distraktor b)	
11	0,45	V		0,1	J	0,8	MU/TS	0,05	B	0,15	B	kunci	0	TB	0	B	Revisi (Daya Beda, Tingkat Kesulitan, Distraktor d)	
12	0,63	V		0,3	C	0,85	MU/TS	kunci	0,1	B	0,05	B	0	TB	0	B	Revisi (Daya Beda, Tingkat Kesulitan, Distraktor d)	
13	0,1	TV		0,3	C	0,8	MU/TS	0	TB	0,2	B	0	TB	kunci	0	B	Revisi (Validitas, Daya Beda, Tingkat Kesulitan, Distraktor a,c)	
14	0,41	V		0,3	C	0,75	MU/TS	0,15	B	kunci	0,05	B	0	TB	0	B	Revisi (Daya Beda, Tingkat kesulitan, Distraktor d)	
15	0,17	TV		0	J	0,9	MU/TS	0	TB	0,05	B	kunci	0,05	B	0	B	Revisi (Validitas, Daya Beda, Tingkat Kesulitan, Distraktor a)	
16	0,56	V		0,1	J	0,85	MU/TS	0	TB	0	TB	kunci	0,15	B	0	B	Revisi (Daya Beda, Tingkat Kesulitan, Distraktor a,b)	
17	0,6	V		0,4	B	0,8	MU/TS	0	TB	0,05	B	0,15	B	kunci	0	B	Revisi (Tingkat Kesulitan, Distraktor a)	
18	0,83	V		0,4	B	0,8	MU/TS	0	TB	0,05	B	0,15	B	kunci	0	B	Revisi (Tingkat Kesulitan, Distraktor a)	
19	0,25	TV		0,3	C	0,6	SU/TS	0,2	B	kunci	0,1	B	0,1	B	0	B	Revisi (Validitas, Daya Beda, Tingkat Kesulitan)	
20	0,55	V		0,3	C	0,75	MU/TS	kunci	0,2	B	0,05	B	0	TB	0	B	Revisi (Daya Beda, Tingkat Kesulitan, Distraktor d)	

Keterangan :

V = Valid

TV = Tidak Valid

R = Reliabel

J = Jelek

C = Cukup

B = Baik

TB = Tidak Baik

MUDAH = 19 butir 95% 20-30% 4-6 butir

SEDANG = 1 butir 5% 40-60% 8-12 butir

SULIT = 0 butir 0% 20-30% 4-6 butir

Kesimpulan = Soal mudah harus dikurangi 13, soal sedang ditambah 7, soal sulit ditambah 6

3. The final result

The final results of this course can be said to be very good with the distribution of grades as follows.

Table 3.10: Distribution of students' final grades is

No	NIM	Nama Mahasiswa	Angkatan	Kehadiran	Part	Tugas	UTS	UAS	NA	Huruf	Pakai
1	22050534032	FARID SANDRA JULIAN SAJID	2022	80%	75	83	50	50	64,9	C+	1
2	22050534033	ALFIN EKA ARDIANSAH	2022	93.33%	78	85	70	80	79,1	B+	1
3	22050534034	RIDA WAHYU ASTIWI	2022	93.33%	85	90	95	85	88,5	A	1
4	22050534035	ALI IVAN MUDHOFAR KUSUMA	2022	93.33%	78	80	75	80	78,6	B+	1
5	22050534036	WINA MAYLINDA CAHYA	2022	86.67%	75	85	50	85	76	B+	1
6	22050534037	DIAN NUR KHARISMA	2022	93.33%	78	83	90	85	84	A-	1
7	22050534038	ADZAN SWARNA ASWARDI	2022	93.33%	80	80	80	85	81,5	A-	1
8	22050534039	YOSSIO NETAYA HARRIS WINANDRI	2022	93.33%	83	78	95	80	83	A-	1
9	22050534041	NATASYA VANIA RAHMAWATI	2022	93.33%	78	85	75	80	80,1	A-	1
10	22050534042	NAYLA DWISTY MAULIDYA WIBISONO	2022	93.33%	78	78	75	60	72	B	1
11	22050534044	ISWARA NOVA RAMADHANI	2022	93.33%	78	75	70	85	77,6	B+	1
12	22050534045	HILZA RALISTIO GERDIEKA	2022	93.33%	83	80	75	80	79,6	B+	1
13	22050534046	AQUILAH PUTRI RINJANI	2022	93.33%	83	83	65	85	80	A-	1
14	22050534047	SYAHRUL FADILLAH	2022	80%	73	80	80	90	81,6	A-	1
15	22050534048	MUHAMMAD FIRMAN RIF'ANI	2022	93.33%	78	78	75	85	79,5	B+	1
16	22050534049	NADA FITRIYAH	2022	93.33%	80	83	95	80	83,9	A-	1
17	22050534050	RISKI RIYALDI	2022	86.67%	78	83	65	80	77,5	B+	1
18	22050534051	FADHIL MUSYAFFA	2022	93.33%	83	78	70	90	81	A-	1
19	22050534052	GHUFRON MU'TI	2022	93.33%	85	80	80	80	81	A-	1
20	22050534053	DYAH SEPTI ANGGRAINI	2022	93.33%	78	78	80	85	80,5	A-	1
21	22050534054	IGNATIUS DIMAS CAHYA KRISTA	2022	93.33%	78	83	85	85	83	A-	1
22	22050534055	ANANTA DWI YULANDA	2022	93.33%	78	80	60	80	75,6	B+	1
23	22050534056	ANIFA ULIN NISAK	2022	93.33%	80	83	65	85	79,4	B+	1
24	22050534057	FEBRI MASDANI BOY ANDRIAS	2022	93.33%	83	75	70	80	77,1	B+	1
25	22050534058	ARIYA FATAH FIRDAUS	2022	93.33%	78	78	70	80	77	B+	1
26	22050534059	MOH. IRFAN FAISAL RIFA'I	2022	86.67%	78	80	75	80	78,6	B+	1
27	22050534060	TRI ANTIKA AZZAHRO ILMA REAFINA MADANI	2022	86.67%	75	85	95	85	85	A	1
28	22050534061	EKA AYUNDA PUTRI NIKMAH	2022	93.33%	78	75	70	80	76,1	B+	1
29	22050534062	ELY ANA PRATIWI	2022	93.33%	80	83	85	85	83,4	A-	1

The distribution of students' final grades is

A : 2 = 6.9%

A- : 12 = 41.4%

B+ : 12 = 41.4%

B : 3 = 10.3%

Discussion

PjBL learning provides students with experience in being able to work on a project assignment completely. In this case, students can complete the task of compiling a multiple-choice assessment instrument from the beginning, namely compiling a grid to analyzing the quality of the instrument. This result certainly provides a complete experience in compiling an instrument. In addition to providing a complete experience in one project assignment, students can also work with very good results.

This is proven by the fact that all students can pass this course well with a minimum grade of B- only 3 students out of 29 students who program the course. There are some weaknesses of PjBL, namely that this model requires more time to work on a project and even has to be done outside of class hours. This means that students are required to work more than just doing assignments. In addition, students are also required to be able to communicate with other parties in order to carry out trials to obtain empirical data.

Case Study learning in this learning evaluation course provides meaning to students in making decisions from a case, namely determining the category of instrument items in three categories, namely valid, revised, and failed. Students as a whole can very well determine the category of the item. The weakness of this Case Study is that it requires students to have comprehensive knowledge. So, there must be a lot of reading to be able to conclude a case. The learning model in the cognitive domain falls into category C5, namely synthesis, which is synthesizing many categories to be made into one conclusion.

4. CONCLUSION

The conclusions that can be drawn from the PjBL and Case Study learning models are as follows: 1) Providing a comprehensive understanding of knowledge from start to finish, so that learning is complete in the course; 2) The final grades of the students were very good with the following distribution; and 3) It takes more time to work on a project than on tasks that are not designed as a project.

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