

The Effect of The Use of Project Based Learning Models and Flip Based E-Modules on Statistics Materials on Students' Interest and Learning Outcomes of Class XI TKJ Students at SMK Ifadah

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Abstract. This research is motivated by the students' very low interest in learning, this makes students unmotivated in the learning process. Lack of motivation to actively participate in student learning has little effect on student learning outcomes. PjBL learning model and flip-based e-module media. This is an alternative that will be tested in this study. Researchers use PjBL learning models and flip-based e-module media for alternative learning strategies that can train students' cooperation so that students can increase their interest in learning. This study was to determine whether or not the use of PjBL learning models and flip-based e-module media on the learning interest of class XI TKJ students in SMK. The type of research used in this research is descriptive quantitative research using One group pretest – posttest research design. The results of this study indicate that there is an effect of using the PjBL model and flip-based e-module media on statistical material on student interest and learning outcomes.

Keywords: *PjBL learning model; Flip-based E-Module Media; Learning Interest; Student Learning Outcomes*

Abstrak. Penelitian ini dilatarbelakangi oleh minat belajar peserta didik yang sangat rendah, hal ini membuat siswa tidak termotivasi dalam proses pembelajaran. Kurangnya motivasi untuk berpartisipasi aktif dalam belajar siswa berpengaruh kecil terhadap hasil belajar siswa. Model pembelajaran PjBL dan Media e-modul berbasis flip. Merupakan salah satu alternatif yang akan diuji cobakan pada penelitian ini. Peneliti menggunakan model pembelajaran PjBL dan media e-modul berbasis flip untuk alternatif strategi pembelajaran yang dapat melatih kerjasama peserta didik sehingga peserta didik dapat meningkatkan minat belajar. penelitian ini adalah untuk mengetahui ada tidaknya pengaruh penggunaan model pembelajaran PjBL dan media e-modul berbasis flip terhadap minat belajar siswa kelas XI TKJ di SMK. Jenis penelitian yang digunakan dalam penelitian ini adalah jenis penelitian deskriptif kuantitatif dengan menggunakan rancangan penelitian *One group pretest – posttest*. Hasil penelitian ini menunjukan bahwa ada pengaruh penggunaan model PjBL dan media e-modul berbasis flip pada materi statistika terhadap minat dan hasil belajar siswa.

Kata Kunci: *Model pembelajaran PjBL; Media E-Modul berbasis Flip; Minat Belajar; Hasil Belajar siswa*

INTRODUCTION

According to (Djumali 2018) "education is to prepare humans to solve the problems of life in the present and in the future". According to (Sutrisna, Sujana, and Ganing 2020), education is a linked activity, and includes various elements that are closely related between one element and another.

Results of observations at IFADAH Vocational School show that teaching materials used only book print and tools help the power point. The teaching materials still not yet can make participant educate interested for follow the learning process. This thing make student not enough interested in the learning process. Lack of interest student for follow learning by active impact low to results study students.

Following this is the result data study mathematics class XI SMK students in odd semesters.

Learning outcomes odd semester students

NO	Subject	Report Score	Information
1	AYD	75	No Complete
2	AW	70	No Complete
3	A	73	No Complete
4	H	70	No Complete
5	HN	84	Complete
6	H	80	Complete
7	KM	75	No Complete
8	LH	70	No Complete
9	M	73	No Complete
10	MK	70	No Complete
11	M	84	Complete
12	MA	80	Complete
13	MYT	75	No Complete
14	MM	70	No Complete
15	NI	73	No Complete
16	NJ	70	No Complete
17	RN	84	Complete

18	RA	80	Complete
19	AU	75	No Complete
20	SE	70	No Complete
21	SH	73	No Complete
22	SM	70	No Complete
23	SMI	84	Complete
24	TD	80	Complete
25	UZ	75	No Complete
26	UZRR	70	No Complete
27	WK	73	No Complete
28	WR	70	No Complete

Based on the table can be known completeness classic not yet achieved. Study results completed student _ by 28.57%.

Interest is a sense of preference and a sense of interest in a thing or activity without anyone telling. Interest is basically the acceptance of a relationship between oneself and something outside oneself. The stronger or closer the relationship, the greater the interest (Effendy 2018). (Sirait 2016) state that: "interest" is feeling more likes and is interested in something Thing or activity certain without ordered.

The learning outcome is a change in overall behavior, not just one aspect of human potential according to (III, Negeri, and Lor 2018). (Herawan 2017) learning outcomes are the attainment of a form of behavioral change that tends to persist from the cognitive, affective, and psychomotor domains of the learning process carried out within a certain time. And the factors that influence student learning outcomes. (Fathurrohman 2018) the factors that influence learning outcomes include internal factors and external factors. Internal factors include physiological factors and psychological factors. Meanwhile,

external factors include environmental factors and instrumental factors . results study student influenced in self student covers Health problems, disability physical, factor psychological (intelligence, interest study attention, talent, motivation, maturity), and readiness students) that affect the learning process and results study student covers factor family, school and community (Nurhasanah and Sobandi 2016).

One of the materials in mathematics is statistical material, it requires understanding deep concept and scope _ wide . Besides Theory this for understand concepts, students should also to do the statistical calculation.

Characteristics student at school the of them is (1) likes discuss and work the same (2) likes media that uses technology (3) curiosity high tofu (4) no happy Becomes students who just sit quietly for class.

Therefore, to teach statistics material, it requires a learning model that can stimulate Activation students and find alone draft study as well as be a learning process more interactive and fun one of the learning models that can stimulate study student is a learning model based on project (PjBL).

Learning model based on project demand student for learn and earn creation so this model could Upgrade motivation study students, improve ability solving problem students, and improve learning student cooperation student in project group (Saputro and Rayahub 2020). According to (Mayasari

and Devita 2020) the steps of the learning model based on project includes: (1) questions base , that is give stimulation study in the form of question to students so that students curious for continue question that; (2) designing plan project, in particular give opportunity to student for identify problem and formulate it in shape hypotheses and plans work project; (3) setting schedule, that is determine time processing project; (4) monitor students , in particular, track action for reduce risk error project; (5) test result, that is prove correct or whether or not hypothesis; (6) withdrawal conclusion (generalization), namely the process of drawing conclusion from what have done. In addition to using innovative models, teachers should also use interesting learning media.

Learning media can be understood as anything that can channel information from information sources to recipients of information (Dewi and Lestari 2020) Learning media as a whole is a tool or material used in the teaching and learning process that has a function as a carrier of information from learning resources . One_ type of media used in the learning process is module learning. The module is one of the tool demonstrations learning self-sufficient student study by systematic without depend on others. one _ type module learning is an e- module flip based. Application module flip electronics can used with flipbook maker app. Application this more from simply text, flipbook creation can

be insert images, graphics, audio, links , and videos on spreadsheets (Ramadhani and Fitri 2020) . with flip book form using page-turning effect will awaken interest study students (GEA 2020).

Based on the description above, the research to be carried out in study this is use learning model PjBL and Media e- module flip based on material statistics to interest and results study student class XI TKJ IN SMK IFADAH.

RESEARCH METHODS

This type of research is quantitative descriptive research because the data analysis technique uses descriptive statistics according to (Sugiyono 2021). The research design used in this study is the One Group Pretest Design. This design contains two tests; O1 is the initial test, and O2 is the post test. X is used as a treatment symbol in the design, namely:

O1 X O2

Table 1

One Group Pretest-Posttest Design, Source: (Sugiyono, 2017)

Information :

O1 = Pretest value (before treatment)

X = PjBL learning model

O2 = Posttest value (after being treated) The research used is a learning interest questionnaire and a test results study

Instruments used in Thing there are two of these:

1. Sheet questionnaire student learning interest is made to determine student learning interest given in the pretest and posttest
2. Learning Outcomes Test Sheet Learning Outcome Sheet is a tool to collect learning outcomes data, this instrument consists of 2 kinds, namely pretest questions and posttest questions:
 - a. Pretest questions are used to collect data on student learning outcomes before being given treatment
 - b. Posttest questions are used to collect data on student learning outcomes after being given treatment.

The data in this study were analyzed using SPSS version 25, the tests used to process the data from this research were 3, namely Normality Test, Homogeneity Test and Hypothesis Testing.

DISCUSSION

The results of the interest in learning questionnaire

This data taken from the results of the interest questionnaire given to the research subject before treating the subject and after the subject is given treatment. The treatment referred to in this case is the use of the PjBL learning model and flip-based e-module media. The following is the data from the interest questionnaire:

Table 2 Interest Questionnaire Scores

NO	Subject	Interest Questionnaire Score	
		Before	After
1	AYD	19	36
2	AW	28	31
3	A	16	30
4	H	17	32
5	HN	15	32
6	H	30	28
7	KM	28	25
8	LH	27	36
9	M	24	36
10	MK	19	34
11	M	20	30
12	MA	32	27
13	MYT	15	35
14	MM	16	35
15	NI	20	33
16	NJ	17	36
17	RN	34	18
18	RA	19	34
19	AU	25	35
20	SE	20	34
21	SH	23	36
22	SM	16	32
23	SMI	20	32
24	TD	36	28
25	UZ	24	32
26	UZRR	19	35
27	WK	30	34
28	WR	16	33

1. Analisa Data

The normality_test of the questionnaire data is in table 1 below:

Table 3 Normality Test Results of Interest in Learning Questionnaire

One-Sample Kolmogorov-Smirnov Test		
Unstandardized Residual		
N		28
Normal Parameters a,b	mean	.0000000
	Std. Deviation	10.11931311
Most Extreme Differences	Absolute	.171
	Positive	.099
	negative	-.171
Test Statistics		.171
asymp . Sig. (2-tailed)		.036 ^c

- a. Test distribution is Normal.
- b. Calculated from data.
- c. Lilliefors Significance Correction.

- a. If the significance value (sig) is greater than 0.05 then the sample study normally distributed.
- b. On the other hand, if the significance value (sig) is less than 0.05, the sample study not normally distributed.

Based on the data in table 3 , it is known that the significance value of Asymp.Sig(2-tailed) is 0.36, which is greater than 0.05. So according to the normality test above, it is concluded that the sample normal distribution research .

2. Homogeneity Test on Learning Interest

Questionnaire is shown in Table 2 below:

Table 4 Homogeneity Test Results of Interest in Learning Questionnaire

Test of Homogeneity of Variances					
		Levene Statistics	df1	df2	Sig.
After	Based on Mean	3.364	7	14	.025
	Based on Median	3.139	7	14	.033
	Based on Median and with adjusted df	3.139	7	6,995	.077
	Based on trimmed mean	3.361	7	14	.026

- a. If the significance value (Sig) is greater than 0.05, it is said that the variance of two or more data population groups is not the same (not homogeneous).
- b. If the significance value or sig.> 0.05, it is said that the variance of two or more data

population groups is the same (homogeneous)

Based on the data in table 4 above, it is known that the value of Sig. Based on Mean for the After variable is 0.025. Because the value of Sig. $0.025 > 0.05$ then it can be concluded that the variance of the data after treatment is homogeneous .

3. Hypothesis testing on the Learning Interest Questionnaire is in table 3 below:

Table 5 Hypothesis Test Results Questionnaire Interest in Learning

The effect test serves to determine whether the regression coefficient is significant or not. Just a reminder that the hypotheses proposed in this analysis are:

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error			
1	(Constant)	40,520	2,452		16.528	.000
	Before	-.377	.106	-.572	-3.555	.001

a. Dependent Variable: After

H₀ = no influence Model PjBL learning and flip-based e-module media (X) on interest in learning (Y)

H_a = there is an influence on the learning model PjBL and flip-based e-module media (X) on learning interest (Y)

For testing this hypothesis, we will compare the Sig Value with 0.05

- If the significance value (sig). smaller < than 0.05 probability means that there is an influence learning model PjBL and flip-based e-module media (X) on learning interest (Y).
- No influence learning model PjBL and flip(X) based e-module media on learning interest (Y).

Based on table 5 above, it is known that the significance value (sig) of 0.001 is smaller than < probability of 0.05, so it can be concluded that H₀ is rejected and H_a is accepted which means that "There is an influence of the model PjBL learning and flip-based e-module (X) on learning interest (Y)".

Learning Outcomes Student

This data was obtained from the results of student learning tests given to research subjects before treating the subject and after the subject was given treatment. Handle mean in case this is the use of PjBL learning model and flip-based e-module media. The following is the learning test result data:

Table 6 Learning Outcome Score

NO	Subject	Study Test Results Score	
		Pretest	Postmates
1	AYD	40	85
2	AW	45	90
3	A	50	83
4	H	45	90
5	HN	45	85
6	H	40	87
7	KM	58	90
8	LH	50	85
9	M	43	60

10	MK	42	78
11	M	40	85
12	MA	80	50
13	MYT	43	90
14	MM	40	85
15	NI	40	83
16	NJ	40	90
17	RN	40	100
18	RA	43	85
19	AU	40	70
20	SE	40	90
21	SH	41	83
22	SM	40	100
23	SMI	40	85
24	TD	45	65
25	UZ	43	87
26	UZRR	41	80
27	WK	43	83
28	WR	56	50

1. Data Analysis

Normality test in the Learning Outcome Test is in the following table .

Table 7 Normality Test Results of Learning Outcomes Test

- a. If the significance value (sig) is greater than 0.05 then the sample study is normally distributed.
- b. On the other hand, if the significance value (sig) is less than 0.05, the sample research is not normally distributed .

Based on the data in table 7 , it is known that the significance value of Asymp.Sig(2-tailed) is 0.36, which is greater than 0.05. So according to the normality test above, it is concluded that the sample research used _ normally distributed l.

The homogeneity test on the Learning Outcomes Test is shown in table 4 below:

Table 8 Homogeneity Test Results Learning Outcomes Test

Test of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
Posttest score	Based on Mean	1.067	4	19	.400
	Based on Median	.401	4	19	.806
	Based on Median and with adjusted df	.401	4	14,073	.805
	Based on trimmed mean	.895	4	19	.486

1. If the significance value (Sig) is greater than 0.05, it is said that the variance of two or more data population groups is not the same (not homogeneous).
2. If the significance value or sig.> 0.05, it is said that the variance of two or more data population groups is the same (homogeneous)

Based on the data in table 8 above, it is known that the value of Sig. Based on Mean for the After variable is 0.400. Because the value of Sig. 0.400 > 0.05, it can be concluded that the posttest data treatment is homogeneous

3). Hypothesis Testing Learning Outcomes Tests are listed in table 9 below

Table 9 Hypothesis Test Results Learning Outcome Test

The effect test serves to determine whether the regression coefficient is significant or not. Just a reminder that the hypotheses proposed in this analysis are:

H₀ = no effect of learning model PjBL and

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	119,922	10,767		11,138	.000
	Pretest Score	-.849	.237	-.575	-3,588	.001

a. Dependent Variable: Posttest Value

flip(X) based e-module media on learning outcomes (Y)

H_a = there is an influence on the learning model PjBL and flip-based e-module media (X) on learning outcomes (Y)

For testing this hypothesis, we will compare the Sig Value with 0.05

- If the significance value (sig). smaller < than 0.05 probability means that there is an influence on the learning model PjBL and flip-based e-module media (X) on learning outcomes (Y) .
- On the other hand, if the significance value (sig). greater than 0.05 probability means that there is no influence on the learning model PjBL and flip(X) based e-module media on learning outcomes (Y) .

Based on table 9 above, it is known that the significance value (sig) of 0.001 is smaller than < probability of 0.05, so it can be concluded that H₀ is rejected and H_a is accepted which means that "There is an influence on the learning model. PjBL and flip-based e-modules (X) on learning outcomes (Y)

Based on results study seen that there is influence the use of learning models PjBL and e- module media to interest and results study students.

Besides it can _ say learning model PjBL and e- module media This flip based is perfect for learning. Compared (Gea 2020) which shows that the flip -based PBL learning model is more influential and . according to (Sinmas, Sundaygara, and Pranata 2019) mentions that the learning model based on very problem _ influential against results and motivation study students.

CONCLUSION

After study produce data analysis with SPSS version 25 help then could concluded that:

- There is influence learning PjBL and e-module flip based on material statistics to interest study student class XI at SMK IFADAH.
- There is influence learning PjBL and e-module flip based on material statistics to results study student class XI at SMK IFADAH.

Effect exerted _ by 82.14%. Impact study the student experience upgrade interest learn and result learn on math on the material statistics.

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