PROJECT BASE LEARNING (PjBL) ON THE UNDERSTANDING OF THE CONCEPT AND PRACTICAL ABILITY OF SOFTWARE ENGINEERING STUDENTS (RPL) ON PROGRAMMING MATERIALS

SINTIA RISNA WARMAN

Informatic Education

Universitas Muhammadiyah Riau

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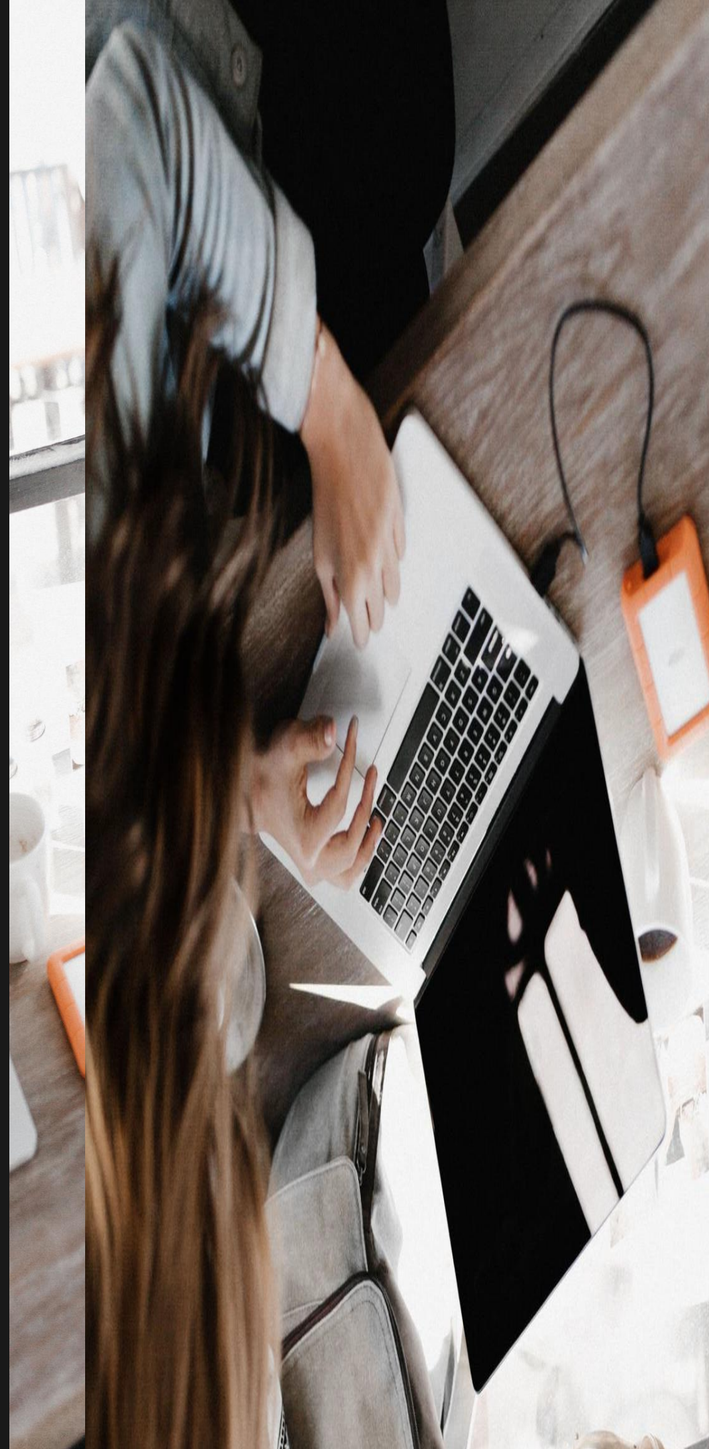
Background of the problem

Web programming has become an important aspect of education, especially in Vocational High Schools (SMK) majoring in Software Engineering (RPL).

(Nafidah, 2019) in her research explained that there are still factors that cause students to be less interested in learning coding and there are still students who feel that the RPL major is closely related to the world of coding and ultimately causes their lack of interest in learning web programming.

A similar problem also occurred when the researcher carried out the PLP program at SMKS Muhammadiyah 2 Pekanbaru. In the practice of Web Programming, students do not understand the material delivered by the teacher, which can be seen from the results of their tests which on average get below the KKM.



Background of the problem

Because the delivery is still one-way and students do not have a strong foundation in the basic concepts of web programming such as HTML, CSS, and JavaScript. This causes students to have difficulty understanding more complex material in completing programming tasks and also students are less interested in web learning due to monotonous learning and lack of ability to understand existing problems.

METODOLOGI PENELITIAN

Research Approach: Quantitative, Quasy Experiment type, design: the non equivalent group design

Research Venue

SMKS Muhammadiyah 2 Pekanbaru, Jln, K; H Ahmad Dahlan No. 90 Kampung Melayu ,Sukajadi District ,Pekanbaru City

Population and Sample

The population in Pelitian is all students of the RPL Department of SMK Muhammadiyah 2 Pekanbaru. Total 152 Students

Sample: students of Class XI RPL SMKS Muhammadiyah 2 Pekanbaru: 54 students.

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Data Collection Techniques

1. Tests (Pretest and Postest)
2. Non Tes (Observasi dan Dokumentasi).

Data Analysis Techniques

1.Descriptive Analysis

2.Comparative analysis

3. Statistical Test

(Normality Test, Homogeneity Test, Hypothesis Test)

1. DESCRIPTIVE RESEARCH RESULTS

Quasy Exsperimen disain *the non equvalen Group Desain 2 kelas experiment dan kontrol*

Quasy Experiment designed by the non equvalen Group Design 2 class experiment and control

The Second Meeting introduced codepen and how to practice using codepen and taught how to apply it in simple web creation with codepen, as well as recalling CSS and how to connect it with HTML to style web pages in Codepen

The Third Meeting introduced codepen and how to practice using codepen and taught how to apply it in simple web creation with codepen,

RESEARCH RESULTS

Validity Test of Students' Pretest Concept Understanding

Pemahaman Konsep	Korelasi (R hitung)	R Tabel	Ket
R1	0,412721	0,361	Valid ($r_{hitung} > r_{tabel}$)
R2	0,491824		Valid ($r_{hitung} > r_{tabel}$)
R3	0,490877		Valid ($r_{hitung} > r_{tabel}$)
R4	0,706954		Valid ($r_{hitung} > r_{tabel}$)
R5	0,445824		Valid ($r_{hitung} > r_{tabel}$)
R6	0,576603		Valid ($r_{hitung} > r_{tabel}$)
R7	0,695608		Valid ($r_{hitung} > r_{tabel}$)
R8	0,486183		Valid ($r_{hitung} > r_{tabel}$)
R9	0,443094		Valid ($r_{hitung} > r_{tabel}$)
R10	0,428998		Valid ($r_{hitung} > r_{tabel}$))

Validity Test of Students' Postest Concept Understanding

Understanding Concepts	Korelasi (R hitung)	R Tabel	Ket
R1	0,618968	0,361	Valid ($r_{hitung} > r_{tabel}$)
R2	0,530942		Valid ($r_{hitung} > r_{tabel}$)
R3	0,618701		Valid ($r_{hitung} > r_{tabel}$)
R4	0,706954		Valid ($r_{hitung} > r_{tabel}$)
R5	0,445824		Valid ($r_{hitung} > r_{tabel}$)
R6	0,721613		Valid ($r_{hitung} > r_{tabel}$)
R7	0,696192		Valid ($r_{hitung} > r_{tabel}$)
R8	0,542973		Valid ($r_{hitung} > r_{tabel}$)
R9	0,615549		Valid ($r_{hitung} > r_{tabel}$)
R10	0,500238		Valid ($r_{hitung} > r_{tabel}$))

Validity Test of Students' Practical Ability

Understanding Concept	Korelasi (R hitung)	R Tabel	Ket
R1	0,468569	0,361	Valid ($r_{hitung} > r_{tabel}$)
R2	0,496152		Valid ($r_{hitung} > r_{tabel}$)
R3	0,838050		Valid ($r_{hitung} > r_{tabel}$)
R4	0,895697		

Concept Understanding Reliability Test

Intervensi	R_{hitung}	R_{tabel}	Keterangan	Kriteria
Pre-Test	0,71389	0,7	$\alpha \geq 0,7$	Reliabel
Post-Test	0,72120	0,7	$\alpha \geq 0,7$	Reliabel

Reliability Test of Pratik Ability

R_{hitung}	R_{tabel}	Keterangan	Kriteria
0,776	0,7	$\alpha \geq 0,7$	Reliabel

Descriptive Statistical Analysis of Concept Understanding

Descriptive Statistics					
	Number Of Samples	Range	Min	Max	Average
Pretest *Experimen*	27	28	60	88	73.63
Postest *Eksperimen*	27	31	69	100	82.74
Pretest Kontrol	27	22	55	77	68.37
Postest Kontrol	27	26	60	86	73.19
Valid N	27				

Descriptive Statistical Analysis of Pratik Ability

Descriptive Statistics					
	Number of samples	Range	Min	Max	Average
Pretest *Experimen*	27	30	60	90	75.44
Postest *Eksperimen*	27	28	72	100	87.30
Pretest Kontrol	27	30	55	85	73.44
Postest Kontrol	27	31	60	91	77.89
Valid N	27				

UJI HIPOTESIS

NORMALITY TEST of Students' Practical Ability

	Kelas	Shapiro-Wilk		
		Statistic	Df	Sig.
Practical Ability	*Pretes Eksperimen*	918	27	.035
	Posttest Experimen	968	27	.556
	Pretest Kontrol	943	27	.141
	Posttest Kontrol	.961	27	.390

The Significance value in the Shapiro wilk test is 0.05

NORMALITY TEST OF CONCEPT UNDERSTANDING

	Kelas	Shapiro-Wilk		
		Statistik	Df	Sig.
Pemahaman Konsep	Pretest *Eksperimen*	.929	27	.064
	Postest Eksperimen	.902	27	.015
	Pretest Kontrol	.956	27	304
	Postest Kontrol	.973	27	685

The Significance value in the Shapiro wilk test is 0.05

CONCEPT UNDERSTANDING HOMOGENEITY TEST

NO	R_{hitung} (based on mean)	Sig.	Kriteria	Ket
1	0,666	0,05	Homogen	$r_{hitung} > r_{tabel}$

HOMOGENEITY TEST OF PRACTICAL ABILITY

NO	R_{hitung} (based on mean)	Sig.	Kriteria	Ket
1	0,187	0,05	Homogen	$r_{hitung} > r_{tabel}$

T TEST (INDEPENDENT SAMPLE T – TEST)

CONCEPT UNDERSTANDING

No	Sig. (2-tailed)	T_{hitung}	T_{tabel}	Ket	Kategori
1	0,000	4,686	1,674	$T_{hitung} > T_{tabel}$	H_1 diterima

T TEST (INDEPENDENT SAMPLE T – TEST)

CONCEPT UNDERSTANDING

No	Sig. (2-tailed)	T_{hitung}	T_{tabel}	Ket	Kategori
1	0,000	4,686	1,674	$T_{hitung} > T_{tabel}$	H_1 diterima

T TEST (INDEPENDENT SAMPLE T – TEST)

CONCEPT UNDERSTANDING

No	Sig. (2-tailed)	T_{hitung}	T_{tabel}	Ket	Kategori
1	0,000	4,686	1,674	$T_{hitung} > T_{tabel}$	H_1 diterima

INDEPENDENT SAMPLE T – TEST PRACTICE

ABILITY

No	Sig. (2-tailed)	T_{hitung}	T_{tabel}	Ket	Kategori
1	0,000	4.692	1674	$T_{hitung} > T_{tabel}$	H_1 diterima

CONCLUSION

1. The average learning outcome of students before the implementation of project base learning (PjBL) assisted by web codepen media was 73.63 and after the implementation of project base learning (PjBL) assisted by web codepen media increased to 82.74, there was an increase with a difference of 12.4

2. The average practical ability of students When implementing project base learning (PjBL) assisted by codepen web media is 87.30 while in the control class that applies conventional learning is 77.89 there is a difference with a difference of 9.41.

3. There was a significant difference between the concept understanding and practical ability of students who used the PjBL method assisted by Codepen web media compared to the control class that used conventional learning

4. The results of this study show that the application of PjBL assisted by Codepen web media has a real positive impact in improving students' understanding of concepts and practical skills. Therefore, this method can be recommended to be applied more widely in other educational institutions, especially in learning that requires a strong understanding of concepts and practical skills such as in the field of Software Engineering (RPL).

THANK YOU