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Development of RPS using a STEAM Learning Approach in the Wood Work Practice Course Building Engineering Education Program

Adhadian Bhakti Dharma[1*], Rijal Abdullah[2], Fani Keprila Prima[3]
[1,2,3] Civil Engineering, Universitas Negeri Padang, Indonesia
[*] Corresponding author: e-mail: adhadianbhakti8@gmail.com

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ABSTRACT

In the Wood Work Practice and RPS lectures used in the Building Engineering Education study program, several discrepancies were found between the RPS and the current Wood Work Practice lectures. In this research the researcher wants to reveal the procedure for developing the Wood Work Practice RPS which is in accordance with the STEAM learning approach in the Department Civil Engineering, Faculty of Engineering, Padang State University. And reveals the level of validity of the development of RPS using the STEAM learning approach in the Wood Work Practice course In the Faculty of Engineering at Padang State University, within the Department of Civil Engineering, the approach employed for this study falls under the category of Research and Development. The development model used is DDD-E consisting of Decide, Design, Development, Evaluation. The research results revealed that the RPS assessment of 6 expert lecturers in the Wood Work Practice course was in the good category with a validation value of 0.86, because this value had exceeded the minimum limit of validity value, namely 0.4, this value was obtained from finding the average of the lecturers' assessments. using the Aiken V formula, these results fall into the practical category. So this RPS is suitable for use in Woodworking Practices.

Keywords: *Development; RPS; STEAM; Woodworking Practice.*

INTRODUCTION

Education involves purposeful and organized efforts to establish a conducive learning atmosphere and processes. The goal is to enable students to actively cultivate their potential across spiritual, self-regulatory, personality, intellectual, moral dimensions, and acquire the necessary skills for personal development as well as contributing positively to society, their country, and the nation [1].

Padang State University (UNP) is one of the largest universities in Indonesia. One of the departments in the Faculty of Engineering is the Department of Civil Engineering. The Civil Engineering Department within the Faculty of Engineering at Padang State University, has two types of workshops, namely construction workshops which include concrete and wood materials, as well as plumbing and sanitation workshops [2] . The Wood Practice course is a type of course that focuses on giving students practical skills in designing and realizing comprehensive wood construction, including the completion steps [3].

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The learning plan for Woodworking Practical lectures is arranged in a learning tool, namely the semester learning plan (RPS), learning planning is the preparation of a plan that details how learning will be carried out for each course. Derived from the outcomes of observations and conversations with lecturers who teach the Wood Work Practice course, discrepancies were found between the RPS and the current Wood Work Practice lectures, namely in the indicators in the RPS, the RPS currently does not contain results related to design and art, then the current RPS is not fully implemented.

In order to strengthen learning, updates and learning approaches are needed so that current wood practical learning is in accordance with the future RPS. The learning approach that supports current Wood Work Practice lectures is STEAM (Science, Technology, Engineering, Art, Mathematics). The STEAM methodology integrates science, technology, engineering methodologies, arts, and mathematics into the learning process. STEAM is designed to enhance a variety of 21st century skills [4], and able to increase students' knowledge in the field of wood construction. This approach will be added to the RPS in the learning methods and strategies section.

METHOD

The type of research that will be used is Research and Development (research and development) or R&D. [5] said that research and development is a research method used to produce and prove the effectiveness of a particular product. The model used in this research is DDD-E consisting of Decide, Design, Development, Evaluation.

The data analysis technique in this research was carried out by testing the validity of the RPS. The validation questionnaire was given to expert lecturers in the Wood Work Practice course, Department of Civil Engineering, Faculty of Engineering, Padang State University, then the validation data was recapitulated and processed using the Aiken V formula as follows.

$$V = \frac{\Sigma s}{n(c-1)}$$ Source: Retnawati, (2016)

Explanation:

s = r - Lo
Lo = Low validity assessment number (eg 1)
c = Highest validity assessment number (eg 5)
r = The score given by the assessor

After getting the validity value, then adjust the validity assessment to the validation category according to the categories in Table 1.

Table 1. Validity assessment categories

No	Percentage of Achievement	Category
1	<0,4	Invalid
2	0,4-0,8	Valid
3	>0,8	Very valid

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RESULTS AND DISCUSSION

Research on the development of Semester Learning Plans (RPS) using the STEAM Learning Approach aims to find out the procedures for developing RPS and producing valid RPS. The developmental model applied in this study is the DDDE development model which consists of 4 stages, namely decide, design, development, evaluate by [7].

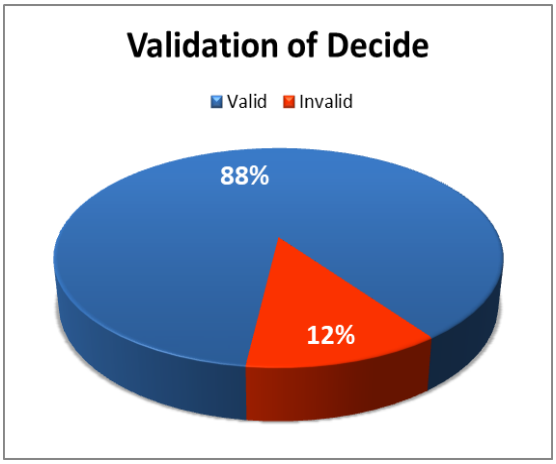
a. Validation of Decide Aspects

This validation questionnaire contains indicators contained in the contents of the RPS later, and the statement items used are from the previous RPS and then modified. Of course, this questionnaire has been validated by expert lecturers.

Table 2. Summary of Decide Aspect Validity Test

No Butir	Penilaian Ahli						S1	S2	S3	S4	S5	S6	ΣS	v	%	Ket
	RB	JS	ASR	FKP	RIZ	FAI										
Butir 1-47	219	219	184	210	231	215	172	172	137	163	184	168	996	0,88	88%	SV

SV: Very Valid



Based on the results of the RPS indicator validity test in the table above, information was obtained that the statements tested by 6 expert lecturers were summarized as showing that statements regarding the RPS indicator obtained an average value of V 0.88, this was categorized as valid and usable. After testing the validity of the decide aspect, we then enter the design stage.

b. Validation of RPS

The following is the level of validity of the design of the RPS, the contents of each question item are based on the results of expert assessments, using the Aiken V formula, which is processed using Ms. Excel 2010 and, the V value is included in the valid category $0.4 \leq V \leq 0.8$. The formula proposed by Aiken V, validation results can be seen in table 3.

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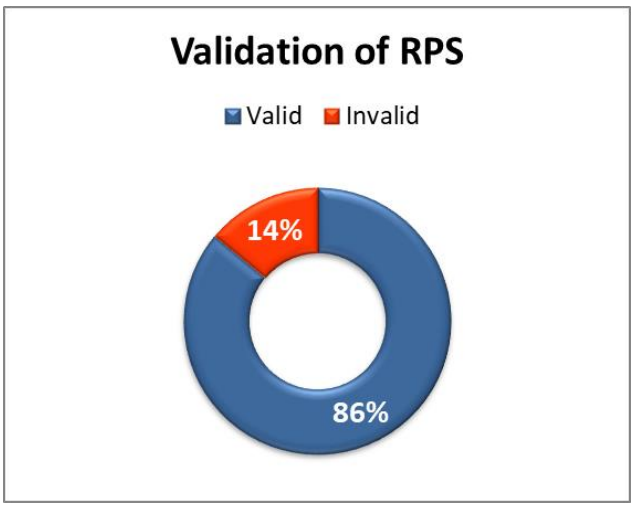
Table 3. Summary of RPS Validity Test

No Butir	Penilaian Ahli						S1	S2	S3	S4	S5	S6	ΣS	v	%	Ket
	RB	JS	ASR	FKP	RIZ	FAI										
Butir 1-28	138	117	112	132	133	114	110	89	84	104	105	86	578	0,86	86%	SV

SV: Very Valid



Based on the results of validation calculations for the design stage which have been summarized from the assessments of 6 expert lecturers, they obtained an average value of V 0.86. So it can be concluded that the resulting RPS development using the STEAM approach is in the valid and suitable category for use.

RPS planning is carried out at the decide stage, determining the indicators in the RPS, determining these indicators is carried out within the Civil Engineering Department at FT UNP (Faculty of Engineering, Padang State University) ,together with lecturers, after being determined, the indicators are then validated by expert lecturers who teach the Wood Work Practice course. In the design or design stage of the RPS, this is done through guidance with the examining lecturer who is also one of the lecturers in charge of the Woodworking Practical course. At this design stage, the RPS template is determined and indicators are prepared which have been validated at the decide stage. Next, at the Development stage, a validity test will be carried out on the results of the RPS design design. The validity test will be carried out by expert lecturers who teach woodworking practical courses at the

CONCLUSION

The conclusion in this research is that it reveals that the RPS development procedure with a learning approach using the STEAM learning approach uses the DDD-E development model, namelyDecide, Design, Develop, Evaluate. The results of the RPS validity test which had been developed using the STEAM learning approach turned out to be valid results with a validity value of 0.86 or 86%

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