

DEVELOPMENT OF A PROJECT BASED ON STUDENT WORK BASE LEARNING ON ELECTRICAL LIGHTING INSTALLATION IN SMK NEGERI 2 LUBUK BASUNG

***Alan Surya Pratama¹, Ridwan² and Hansi Effendi²**

¹Magister Student of FT, Universitas Negeri Padang

²Electrical Engineering Lecture, Faculty of Engineering, Universitas Negeri Padang

Email: spalan@gmail.com

*Corresponding Author, Received: March 10, 2019, Revised: April 15, 2019, Accepted: May 10, 2019

ABSTRACT

This research aims to: (1) develop learner worksheets lesson installation of electric lighting and (2) to describe the response of teachers on implementation-based learning, project based learning on subjects of installation of lighting electricity. This research is a research and development (R&D) and ADDIE model. This stage of the analysis is the process that will determine the learning process that will be studied learners. The stage design was developed from the initial draft of the learning process and assessment instruments. The stage of development is based on the initial draft of the repair validation expert lecturers and teachers, then conducted a limited trial in SMK Negeri 2 Lubuk Basung. Stage of implementation of the testing results of tests done learning learners and test project to find out the effectiveness of learner worksheets developed. This stage is also done charging the response question form filled out by teachers and learners. the last stage is evaluation, which the researchers evaluate at each phase of the development of learning materials worksheet learners further revision to find out if learning materials developed for already applied or Yet in learning. Data capture instrument in the research on learner worksheets, now the response of teachers and learners. Validity of data analysis techniques and materials now response using category scale of four. The results showed that in the aspect of validation, a worksheet developed learners have the average percentage in the valid criteria with the percentage of 83.33%. Aspects of the practicalities, learner worksheets developed have the average percentage in the practical value of the percentage criterion 88.64%. The aspect of effectiveness, the learner worksheets developed in criteria effective percentage that has good value knowledge 76.15% nor the project measured from the ketuntasan of classical learning to learners. The conclusion to be drawn that the learner worksheets based project based learning on subjects of installation of electric lighting already fits the criteria of a valid, practical and effective to use.

Keywords: Learner Worksheets, Project Based Learning

INTRODUCTION

SMK is an educational institution that provides learners not only with knowledge but also skills as a life skill (Asliyani *et al*, 2014). Learners are required to be able to understand the theories and experts in their precontractors. SMK that aims to prepare graduates as a workforce that is able to compete in the workforce. Education at SMK currently has a very stressed development that every learner must have a religious attitude, social, honest, and cooperating together so that it can lead to confidence in learning according to the The 2013 curriculum. The Law of the Republic of Indonesia No. 20 of 2003 on the National Education system in section 36, stated that curriculum development is conducted referring to national education standards to realize national education objectives. The development of curriculum is hoped to bring a balance between the development of spritual and social attitudes, curiosity, creativity, cooperation, with intellectual and psychomotor skills. Curriculum development also consists of learning devices such as syllabus, RPP, teaching materials, and learning media. Planning the learning process itself is made in the form of a Learning Implementation plan (RPP) which is the stage of learning that will be applied to the learners. This is due to the fact that in the curriculum, syllabus and RPP are only written broadly in the form of reference material to teach, being the task of educators to describe the material to teach it so that it becomes a teaching material Complete.

The law No. 30 of 2009 states Ketanagallistik is everything that concerns the provision and utilization of electrical power and supporting enterprises of electric power. Electricity own rules that must be met to ensure the safety of electricity. Safety electricity pursuant to LAW No. 30 of 2009, which is any effort or measures to safeguard the electrical power supply and security of power utilization to realize reliable conditions for installation, safe from harm to Human beings and other living creatures, as well as environmentally friendly conditions, around the installation of electrical power.

The explanation of the installation lesson itself has material that can give lessons to learners to face problems among the community. The material of the lighting installation itself is how learners determine the installation conditions of the home installation in accordance with the standards. Giving the students the opportunity to

determine their own design to provide experience, active, critical thinking, and to solve problems faced with the rules and standards of lighting installation. The design itself consists of several sections namely building floor plan, component layout, single line diagram, wiring Diagram, and RAB.

The material of the installation design itself will be made in the form of a student's spreadsheet hereinafter abbreviated to (LKPD). Fitri *et al.*, (2015) suggests that learning to use LKPD can help educators guide learners when delivering learning materials. This LKPD is used as a learning tool by educators and students during the learning process so that it goes well and precisely. LKPD is also used as a means of enhancing the active learners in the learning process. The LKPD criterion is said to be good as well as in accordance with the 2013 curriculum, which is learning related to the learning process and providing student character content and assessment of student learning outcomes. LKPD is also a learning sember that can be used simultaneously with other learning resources or other learning media.

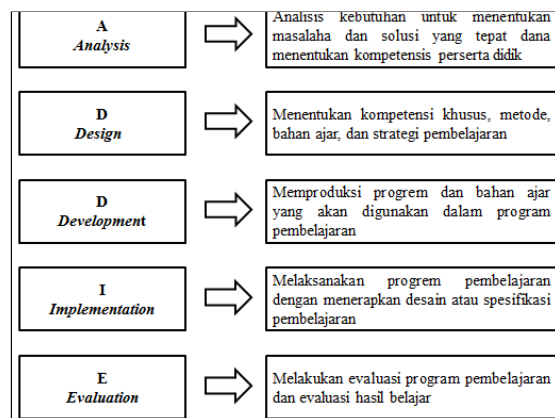
Results of observations and interviews of researchers with several productive teachers electrical installation techniques in SMK Negeri 2 Lubuk Basung, especially the electrical lighting installation subjects, showed that the learning done in schools is Lack of the learning process that is done using the LKS that are still centered on educators so that there are still learners who play in the learning process, the old LKS have not been made in the form of LKPD according to the curriculum 2013, The LKS that are commonly used only refer to SK and KD without looking at the necessary needs, learning only sees how it can complete learning objectives such as practice, the limitation of time-to-face teaching and the practices that will Implemented, learning tools are only books that are owned by the educator subjects, a lack of tool and material practices where the number of learners compared to the practice tools still less relevant. Agar dapat mengembangkan LKS pembelajaran instalasi penerangan listrik sesuai kurikulum 2013, maka tindakan alternatif yang bisa ditawarkan sesuai harapan yaitu LKPD berbasis *project based learning*. Dengan kata lain, pengembangan LKPD pembelajaran berbasis *project based learning* pada penelitian ini merupakan upaya terencana dan berkelanjutan untuk pembelajaran instalasi penerangan listrik yang

nantinya akan di aplikasikan bagi peserta didik teknik instalasi tenaga listrik SMK Negeri 2 Lubuk Basung.

Project based learning is a learning model that uses problems as a first step in collecting and integrating new knowledge based on real-life experience. Project-based learning is designed to investigate learners as well as to understand when faced with complex problems. For the learning objectives to be achieved well, which students become active learners, students become student centers, develop high-level thinking skills of learners, students can manage their own activities Completion of the project or learning tasks so that in the learning process can be more independent and also can provide a deep understanding of knowledge to the learners, then the project-based learning is suitable applied to the installation subjects Electrical lighting.

METODE

The ADDIE Model was developed by Dick and Carry (1996) to design a learning system. Development in this study, using the previously described stage using ADDIE-based expressed by the private (2009). This development procedure can be seen in Figure 3. Following.



Gambar 1. The procedure of Developing a Project Based Learning Student Worksheet

The validation instrument is conducted requesting the opinion of three experts (expert assessment). The experts involved are the evaluation and expert experts involved in the field of educational media and electrical engineering.

RESULTS AND DISCUSSION

Based on research data, the study was obtained based on respondents/experts such as table 1.

Table 1. Media Expert Assessment Data

No	Indikator	Aiken's V	Ket
1	Didaktik	0,861	Valid
2	Konstruksi	0,800	Valid
3	Desain	0,815	Valid
4	Teknis	0,833	Valid
5	Syarat Penggunaan	0,778	Valid
Jumlah		0,817	Valid

Table 2. Material Expert Assessment Data

No	Indikator	Aiken's V	Ket
1	Kemudahan Penggunaan	0,861	Valid
2	Efisiensi waktu	0,800	Valid
3	Interpretasi	0,733	Valid
4	Ekivalensi	0,833	Valid
Jumlah		0,807	Valid

Table 3. PjBL-Based LKPD Results Data by Educators

No	Pendidik	Persentase	Kategori
1	Praktisi 1	88,46%	Praktis
Jumlah		88,46%	Praktis

Table 4. Practical Recapitulation Based on Learners Response

	Peserta Didik	Persentase (%)	Kategori
1	1	88,46	P
2	2	86,54	P
3	3	88,46	P
4	4	90,38	SP
5	5	89,42	SP
6	6	88,46	P
7	7	88,46	P
8	8	87,50	P
9	9	88,46	P
10	10	89,42	SP
11	11	88,46	P
12	12	88,46	P
13	13	89,42	SP
14	14	88,46	P
15	15	87,50	P
16	16	81,73	P
17	17	85,58	P
18	18	89,42	SP
19	19	85,58	P
20	20	83,65	P
21	21	88,46	P
22	22	85,58	P
23	23	90,38	SP
24	24	89,42	SP
25	25	91,35	SP
26	26	89,42	SP
Rata-rata		88,02	P

Table 5. Statistical Calculation Result of Learners Test Scores

Statistics		
Kognitif		
N	Valid	26
	Missing	0
Mean		76,2500
Std Error Of Mean		1,06744
Median		75,0000
Mode		75,00
Std. Deviation		5,44289
Variance		29,625
Range		25,00
Minimum		65,00
Maximum		90,00
Sum		1982,50

Table 6. Statistical Calculation Result of Student Practice Value

Statistics		
Kognitif		
N	Valid	26
	Missing	0
Mean		81,6623
Std Error Of Mean		0,58209
Median		81,2500
Mode		80,36 ^a
Std. Deviation		2,96807
Variance		8,809
Range		10,71
Minimum		76,79
Maximum		87,50
Sum		2123,22

IPL learning is a process of increasing learners ' ability to plan electrical installations based on implementation procedures and with general regulations of electrical installations. In addition, IPL learning is an educational process that serves to guide learners systematically and in a direction to foster a responsible attitude towards what they do. PjBL-based LKPD is performed a validity test assessment, practicality and effectiveness of PjBL-based LKPD. As stated by Endrya (2010) that "a teaching material is developed, usually used in the study first Must pass validation tests, practicality and effectiveness ". PjBL-based LKPD developed in terms of teaching materials has fulfilled five aspects of assessment with the validation value obtained from each validator, hence the Aiken's V with an average of 0.817. A PjBL-based LKPD developed in terms of material also has a validation value from the validator hence the Aiken's V with an average of 0.807. LKPD's practical test results by educators with a percentage of 88.46% with practical. These results suggest that PjBL-based LKPD is developed to make it easier for educators to help students learn independently

and to help educators understand the concept of learning materials. The test results on 26 learners and test projects get a good value of the score of the rat, but there are still three students of learners who are under the boundaries of the submission. The percentage of learning to classify the knowledge field has an average value of 72.85% and a field of skill or project of 79.45%, so based on the table of learning the classification Knowledge and skill fields achieve high criteria, it can be concluded that the PjBL-based LKPD is effectively used with a percentage average value of 76.15%.

CONCLUSION

PjBL-based LKPD research on IPL subject to an ADDIE development model consisting of Analysis, Design, Development, Implementation and Evaluation. A teaching device made in the form of LKPD, study result test assessment instruments and project test assessment instruments. PjBL-based LKPD on IPL subjects developed already in line with valid criteria. This is evidenced by the LKPD and the learning assessment instruments developed after completing the assessment stage by expert lecturers and teachers of the group who produce LKPD materials and assessment instruments in valid criteria. PjBL based LKPD on the developed IPL subjects is in line with practical criteria. This is evidenced in the results of practicality by educators on LKPD materials, learning devices consisting of LKPD and assessment instruments in practical criteria. PjBL-based LKPD on IPL subjects developed already in line with effective criteria. Aspects of effectiveness in the see from the percentage of learning to the classical study of the test results and the test of the project. Based on the classifications aspects, the test results of the study and the test project in very high criteria with an average value percentage of 76.15% of the submission.

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