

# HOW IS THE PRACTICALITY OF PRODUCTION BASED LEARNING MODEL DESIGN IN VOCATIONAL EDUCATION?

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13  
**HOW IS THE PRACTICALITY OF PRODUCTION BASED LEARNING  
MODEL DESIGN IN VOCATIONAL EDUCATION?**

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12  
**ABSTRACT:** This research is aimed to produce a design of learning model in the form of a practical production based learning model for learning in higher education of vocational education and training. Type of the research is research and development. It was limited to identify that production based learning model is practical, and then the product was tested to users; lecturers and students. The questionnaire for assessing the practicality consisted of level of practicality sheet for the users. This instrument was made by using linker measuring scale. The practicality sheet covered lecturer and students perception towards production based learning model. It can be practical if it meets the criteria of aspect which is tested to the lecturer to identify attractiveness aspect, aspect of development process, aspect of user practicality, aspect of functionality and usability, and aspect of reliability. The result of the research shows that production based learning model is practical from the lecturer view. Besides, from the students' view, by identifying the students' interest, process of its use, improving students' activeness in learning process, the product is also practical. These research findings prove that production based learning model is practical and be able to be used in higher education especially in practice courses which expect the students to produce a good product in the form of prototype, blueprint, and concept. This production based learning model can be developed and used on different courses based on the learning needs.

**Keywords:** Practicality, Production Based Learning, Higher Education

## 1. INTRODUCTION

Vocational education is required to produce a competent workforce in order to increase productivity and efficiency as well as the readiness of the international labor market competition in the era of globalization. For the achievement of the learning process as stipulated in the Law of the Republic of Indonesia Number 20 Year 2003 and Government Regulation No. 32 of 2013, the necessary components of learning that can support the learning process. One of the components of learning is learning model that corresponds to the standards which support education in order to be able to be effective and efficient.

The learning model is one component of which is the primary and essential in supporting the learning process. Therefore, it is necessary to improve the utilization and management so that the desired objectives can be achieved. The model is a description of a reflection of reality that will be done, such as the definition of a model. According to (Brown, and Green, 2011) "models by definition are a reflection of reality; temporary stand-ins for something more specific and real; models are helpful in explaining that may be difficult, to describe; may illustrate a model of a process; A models may be a representation of something".

Prawiradilaga (2008) termed as a model of working procedure that regularly and systematically containing thoughts, description or explanation of a concept. Sardiman (2007) interpret the interaction process of learning as educators with learners to encourage them to learn actively, participatory,

interactive with the use of methods, approaches, tools / media, and an appropriate learning environment. Okolocha and Comfort (2012) defines learning as a basic process of adding information and new capabilities.

The above explanation can be understood that learning model is a procedure or steps that need to be done by educators to facilitate learners to learn actively, participatory and interactively, with the intention of meeting of the educational goals, namely the development of the potential for self-learners optimally. With the creation of a good learning model is expected to have an impact on the learning process that goes well too in accordance with the Standards of Content, Process, Assessment and Competency Graduates to be achieved.

Standards of National Education, in Government Regulation No. 32 Year 2013, are explained that: "Graduates Competency Standards are the criteria regarding the qualifications of graduates' capabilities that include attitudes, knowledge and skills". This article emphasizes that every student should have the attitude and the mastery of knowledge and skills in order to achieve the learning objectives.

Government Regulation No. 32 Year 2013 also describes the content standards, explained that: "Content Standards are the criteria concerning the scope of material and level of competence to achieve competency of graduates at the level and type of education". This article emphasizes that every graduate of higher education must be in accordance with a predetermined curriculum.

Moreover, the Government Regulation No. 32 Year 2013 describes a standard process that explains that the minimum criteria of student interaction with lecturer

and learning resources in the learning environment, resulting in the development of knowledge, skills enhancement, and the formation of attitudes to meet the learning outcomes. This article emphasizes that the interaction between students and lecturers and learning resources should be conducive, so that later can achieve the learning objectives.

As the complement of the above three principles, Government Regulation No. 32 Year 2013 describes the assessment standards contained in article 24, paragraph 1. The article explains that the minimum criteria of systematic activities are carried out to determine the qualification of planning and execution, and control of the learning process, as well as after learning achievements of students through the process of learning.

In fact, the learning process is still far from the principles that have been described in the Law of the Republic of Indonesia Number 20 Year 2003 and Government Regulation No. 32 of the year 2013. Even though, vocational education is required to produce competent workforce in order to increase productivity and efficiency and readiness on competition in the international labor market in the era of globalization. However, based on the data owned by the Central Statistics Agency (BPS) open unemployment rate in February 2016 amounted to 5.50%. This means that of the 100 workforce, there are about 5-6 people unemployed. "When compared with the condition in February 2015, TPT has decreased by 0.31%. TPT is filled by graduated from the College of both the Diploma and Bachelor These data expose the weakness of college graduates in the competitive labor market, this is due to the learning process that occurs during this time is still oriented to the output instead of outcomes.

This is no exception to the implementation of the learning process carried out at the Faculty of Engineering, The State University of Padang which still produces output from each membership but have not touched the aspect of outcomes. Likewise, the practice of learning in vocational education has not been seriously developed based on the principles that have been described to give students the opportunity to learn intelligent, critical, creative, innovative, and problem solving. As we have seen the development of science and technology is developing very fast. Therefore, it should be anticipated by lecturers and students in preparing graduates who are competent. One area of study that is developed very rapidly is a series of power electronics associated with the tools electronics which are consumed by society nowadays. For it is concerned with mastery of competencies in the subject of the practice of power electronics circuits required an innovative learning system to provide additional value for students.

Currently the process of learning of power electronics circuits' practices made on electrical engineering industry of FT UNP has not succeeded in making students employable and independent, but still in level of ready trained. Practical learning on subjects of Networks Power Electronics at the Department of Electrical Engineering Industry has not shown as a process of development of student creativity.

In the process of learning applied is seen that the learning model is not oriented to the skills in the world of work. Based on observations of the author, almost all of the learning processes executed in conventional methods, where the students come, give the tools and materials, assembling circuit and testing circuit, and the

results assessed based on observation. In this case there is rarely an assessment of the student's understanding of what they do. From interviews with several students who are following the practice of Power Electronics Networks revealed that there is little time provided by lecturers to explain what to do and how to do it. As a result, students often do not coherently working order, and sometimes can damage its components.

Based on the findings at the time of observation as described above, there are some problems and phenomena related to the education and training provided to students (especially in Practice Series of Power Electronics) is not in accordance with the needs of skills / competencies and skills that they will face in the world of work later. It is necessary for studies of depth, namely in the form of research. Based on the research findings was found later defined strategy improvement for the future. So we need one alternative to development of Production based learning model. this model in the stage of its implementation is an part of active learning in which learners are given the opportunity to develop the potential, skills and creativity in the learning process of practices. The production based learning model is a new development of learning model that is expected to be an alternative solution to the implementation of the process of learning the practice of Power Electronics circuit. In essence, the production based learning model gives learners the opportunity to develop and direct the learners through the steps which are structured in the learning process.

Production based learning model development on vocational education is in line with the opinion (Okolocha and Comfort, 2012) "Vocational technical education can be defined as an educational training which encompasses knowledge, skills, competencies, structural activities, abilities, capabilities and all other structural experiences acquired through formal, on-the-job or off-the job the which is capable of enhancing recipient opportunity for securing jobs in various sectors of the economy or even enabling the person to be self-dependent by being a job creator ", from this quotation, vocational education can be defined as the educational training that includes knowledge, skills, competencies, activities of structural, ability and all the experience of other structural gained through formal, at work or not, which may increase the chance acceptance of jobs in various sectors of the economy or even allow people to be independently to be a job creator. The series of these activities should be designed in a learning stage to support the creation of experience and skills even able to open their own jobs. Of course, the production based learning model in line with the concept of vocational education. Furthermore, this opinion was confirmed by Ganefri, (2013) about production based learning model is "production-based learning models is defined as the procedures or steps that need to be performed by the educator to Facilitate learners to Actively learn, participate and interactive, with a competency - orientation to produce a product either goods or services required", this quotation mentioned production based learning model is defined as a procedure or steps that need to be done by educators to facilitate the learners to actively learn, participate and interact, with competence and orientation to produce both goods and services required.

Production-based learning model that will be developed in outline its implementation in the learning

process which learners together with educators define and agree on what the product will be made jointly both educators and learners with reference to the basic concepts of power electronics circuits' lab materials. Then the students were asked to make an important question about a product, a variety of questions concerning the next product to be mapped questions aimed to see the need and urgency to manufacture products that will be done by students. Furthermore, the students conduct a needs analysis tools and materials of the product to be made and agree a timetable for the manufacture until the finishing product.

This study aims to produce a draft model of learning in the form of production-based learning model that is practical for learning in Technology and Vocational Education of Higher Education

## 2. RESEARCH METHOD

6  
The development of research aims to develop a production based learning model in the form of a valid product, practical and effective. This study is limited to see whether the production based learning model is practical. Learning conditions are analyzed to identify the weaknesses of learning. This study uses research and development (RnD). This research includes research that develops and produces production based learning model.

Phase studies of Instructional Model-Based Production simplified, include activities namely: a preliminary analysis, design, evaluation and revision (Borg & Gall, 2003).

### Development Procedures

#### 1. Preliminary Analysis

Needs analysis is the first step in development research. At this stage the researchers analyzed the subject matter to be developed in a production-based learning model that corresponds to essentially competence, analyze the characteristics of students, which include background capabilities, and analyze the ability of lecturers to address learning problems in Educational Technology & Vocational of Higher Education.

#### 2. Designing

Production Based learning model which was developed tailored to subjects where research is in practical power electronics circuit. Steps to be done are to determine the main concepts contained in power electronics circuits. The concept was developed in a way that is easy to understand by the students.

#### 3. Evaluation/Revision

At this stage, the products that have been made will be evaluated, by testing it to all users (lecturers and students) in small and large groups. Suggestions and comments from users is used to revise the draft model of learning

#### Practicality Phase

The practicalities are level of usable production-based learning model in the learning activities, namely carrying out the teaching experiment by using production based learning model has been revised based on user ratings. Production-based learning model have a high practicalities when practical which means easy to use, easy examination and complete with clear instructions.

This phase is performed limited testing on electrical engineering students of the Faculty of Engineering industry of The State University of Padang. To determine the practicalities of production based learning model, researchers used a practicality questionnaire sheet.

#### Research Instrumentation

The research instruments were developed to collect data in this study is the practicality questionnaire sheet of production based learning model by lecturers and students. Suharsimi (2009) defines questionnaire as a list of questions or statements that must be filled by the respondents to be evaluated. These practicalities questionnaire were filled by the user, namely lecturer and students.

For students from practicality questionnaire was seen the interest of students, the process of use, increasing the activity of students and a student in learning the practice course power electronics circuits. As for lecturers aspect are viewed aspects of attractiveness, developing a process aspect, the aspect of ease of use, functionality and usability aspect and the aspect of reliability.

#### Techniques of Data Analysis

3  
Techniques of Data analysis used were descriptive data analysis techniques, by describing the practicality of using production-based learning model. The practicalities questionnaire filled by users i.e.; lecturer and students, to see the extent of the practicality of the model designed.

## 3. RESULTS AND DISCUSSION

### Preliminary Analysis

At this stage begins with a preliminary study by conducting needs analysis, needs analysis is the first step in development research. This stage was aimed to bring up and establish the basic problems encountered in learning, so that we need a learning model development. With this analysis we will get description of facts, expectations and basic problem solving alternatives, which facilitate the determination or selection of instructional methods developed. Additionally, based on observations made in the course of learning the practice of power electronics is known that there are some problems and obstacles in the learning process. Problems were found among which learning process practices that lasted only aims to complete the circuit has been established, where the learning process, just focus on the completion of the set given that merely assemble components according to the image existing circuit and the circuit boards that have been there, resulting in practical learning activities less interesting, boring, and not challenged students producing creatively

Besides, the learning model that currently is not able to optimize the potential of learners, and yet optimize existing learning. This condition apparent that the learning is done yet oriented products. It is especially products that are oriented to the needs of the community (user) and industry. Further discussions with the lecturer of the course on the learning conditions and the description of the implementation and testing of production-based learning model will be implemented in the Department of Electrical Engineering Industrial Electrical Engineering Program. The results of discussions with the lecturers obtained the correct

information that practical implementation is still limited testing and applications, understanding the concept of learning theory that has first received. Related to this production-based learning model, lecturers are very welcome and support research by facilitating the implementation of what is needed for research.

In the analysis of the curriculum, the researchers conducted a discussion with the lecturers to adapt the products produced by the students and analyze Learning Outcomes on learning to be developed. In this implementation of the resulting product is a power bank and the water detector that subject matter which includes among others the concept of half-wave rectifier, full wave rectifier, rectifier with filter and Silicon Control Rectifier (SCR). Aside from understanding the concept of the material and is able to produce a product, students are also guided in planning a business plan.

In the analysis of learners, learning activities carried out in a cooperative and collaborative in producing a product by following the guidance in the form of learning job sheet based production and business plan production based learning. Through this model students are invited to creative thinking, problem solving and able to produce marketable products

#### Designing

Production Based Learning Model design stage will be done to define the scope of the development model of learning in the learning lab. The initial step to establish the draft Production Based Learning Model which will be applied to the learning lab by designing the initial draft of the model, at this stage determine and discuss products based learning model of production, namely (1) Analysis of curriculum and characteristics learners, (2) Identification and analysis of products (3) Make important questions about the product, (4) Mapping the question, (5) analysis of the needs of the equipment and materials of the products to be made, (6) Preparation Schedule of manufacture of the product, (7) the process of making the product, (8) Evaluation periodically, (9) Preparation of Business plan (Ganefri & Hidayat, Hendra, 2015).

#### Practicality of Production Based Learning Model

Furthermore, the implementation at this stage, expanded trials start in a small group, and large group continued to determine the level of the practicalities models developed. This stage also included discussions and interviews to professors who teacher and students to the practice of power electronics with product-based learning model. Small group trials conducted to 8 students were included with the interview about the ease of use of products of Production based learning model. From interviews obtained shortcomings of the production-based learning model and then revised in accordance with the findings obtained. After the revised of production based learning model to students back in testing to large group consisting of 43 students and is also accompanied by an interview about the model applied.

Assessment and test results practicalities production based learning model, from trial data obtained scoring average is 87.50 practicality when referring to data from qualitative to quantitative conversion in 2013), it includes practical category. While the practicalities of assessment and test results of products based learning model student response data

may be retrieved from an average of practicality votes i.e.; 79.97 if referred from qualitative to quantitative conversion data (Widoyoko, 2013), then the category of practical and large group of such data can be taken scoring average is 85.30 practicality when referring to data from qualitative to quantitative conversion (Widoyoko, 2013) that included a practical category.

Based on the practicalities of the test done to the lecturers and students gained some input and revisions as follows:

- a. Lecturer
  - 1) Submission of a series of images in job sheet Production based learning model are more cleared and caption information in the image series is not yet complete.
  - 2) On a more detailed guide to learning model again the activities undertaken lecturer and students
- b. Students  
From interviews with a small group found that students still have difficulty in reading and assemble circuit as an explanation for each component that is required yet.

#### Data Analysis of Practicality

Data of practicality of production based learning model is taken through a trial conducted in the Department of Electrical Engineering at students majoring in Electrical Engineering Industries are taking courses in power electronics. This trial aims to see implementation of production based learning model. An assessment of the practicalities of production based learning model obtained from a questionnaire completed by the lecturer / practitioner and students. To get a response about the production is carried out production based learning model with two trials, namely with small and large groups.

An assessment of the practicalities of production based learning model obtained from a questionnaire completed by the lecturer / practitioner and an assessment of the production-based learning models are developed in the category Practical with an average percentage of 87.75.

In addition to the assessment of the lecturer / practitioner, practical of production based learning model are also assessed based on student feedback through questionnaires, the variable interest student 78.65, 78.13 and process variables of use variable increase in activity of 75 students with an overall average percentage is 77.26 with category is quite practical. The results of the practicalities of data processing were based on the response of students in small groups. The findings obtained in the test the practicalities of small groups and then repaired and tested back to get feedback from students on a large group consisting of 43 students. Results of votes obtained by the practicalities of large groups of variable interest 84.4 86.2 uses of process variables and variables increase student liveliness 83.37 with the overall average percentage is 84.65 with a practical category. It can be concluded that based learning model developed production categorized practically used as a learning model.

As mentioned previously, practicality is interpreted as level of usable, easy to use, easy examination and complete with clear instructions. Practicality of this model certainly meets that criteria, aspects tested to the lecturers to see aspects of attractiveness, developing a process aspect, the aspect of ease of use, functionality

and usability aspect and the aspect of reliability. The results showed that the production based learning model by the lecturers had practical, while the students to see the interest of students, the process of use, increased activity of students in the learning process. Based on the analysis of the practicalities test both lecturers and students gained practical category, it means that this model is easy to use, clear instructions for use and is able to used in the learning process.

Research related to the practicality of teaching in the classroom is actually a lot to do on the practicality of a learning model. Production based learning Model with nine stages of production as proposed by Ganefri and Hidayat, Hendra (2015) already conducted trials to see practicality of this learning model. This implementation is very important in order to provide and help explanation application of learning models for lecturer and students. Vocational education is one of the groups part of science education that prepares graduates to be able to work in their fields and have the ability to survive, so it impractical the use of this production-based learning model will affect the realization of the purpose of vocational education (Miller, 1985 ; Finch & Crunkilton, 1984 ; Evans & Edwin, 1978).

Practicality of a learning model will certainly have an impact on the use of the learning process, especially an impact on learning outcomes of students (Kember, & Kwan, 2000; Karumpa; Parawangsa; Mansyur; & Saleh, 2016; Steele, 2013; & Crookes, 2010). Practicality of Production based learning model is very important to be able to conduct the next development phase, if the model is already said to be practical so the researchers could conduct research into the effectiveness phase of this learning model.

#### 4. CONCLUSION

Based on the results and discussions that have been described, there are some conclusions, as follows:

1. Production-based learning Model is practical applied to the learning process.
2. Practicality of production-based learning model suggests that this model is easy to use, clear instructions for use and is able to use in the learning process.

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