

The Development of Production-Based Learning Approach to Entrepreneurial Spirit for Engineering Students

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Abstract

Vocational education aims to produce workforce. However, in reality there is a shift that the vocational graduates are not only prepared to work but also they are expected to open or create new work opportunity. To overcome the mentioned educated employment, we offer an alternative solution to integrate production based with the learning process; the outcome would be the entrepreneurial ability of the engineering students. The results of this study showed that the implementation of production based learning with entrepreneurship approach using workshop based lectures, qualitatively improved the quality and meaningfulness of the learning. The learning experience which connects the interns and the works or work products is indeed in line with the field specification and standard. The learning process has given impact to the entrepreneurial interest improvement assessed in the beginning and at the end of the semester. Besides that, the learning activity gives impacts to the cognitive discourse, psychomotor skill, and work attitude improvement build integrally. Thus, the model is deemed suitable to be utilized in the learning to improve the students' entrepreneurial interest.

Keywords: learning, production, entrepreneurship

1. Introduction

Vocational education is education that prepares students especially for work in specific areas (Law No. 20 of 2003, article 15). The Mission of vocational education is also preparing the learners to be able to deal with changes in the community especially for working in a particular field. Jama and Adri (2010) states that "the Vocational education should be responsive to the changes in society. In this era of the rapid change of technology, vocational education must play many important roles in order to take roles in the world of work." In addition, vocational education is demanded to produce a competent workforce in order to increase productivity and efficiency as well as the readiness for the international labor market competition in the era of globalization.

According to the BPS data of February 2012, noted the number of unemployment in Indonesia reached 7.61 million. This number has decreased significantly compared to the number of unemployed in August 2011 reaching 7.7 million. While in February 2011, unemployment amounting to 8.14 million people with 4% Diploma graduates (304,000) and 5.7% Bachelors degree graduates (434,000). In view of this numbers of unemployed graduates, there is no exception in the implementation of the learning process at the Faculty of Engineering, Universitas Negeri Padang (UNP), Indonesia, which still generates its output from individual skills and still has not touched on aspects of the learning outcomes which focused on the entrepreneurship ability. Thus, currently, the university graduates generated are job seekers, not creators of employment. Efforts need to be done to overcome the increasing number of well-educated unemployment by preparing graduates who have a soul of entrepreneurship. The entrepreneurial skill is an alternative solution to resolve the problem of unemployment and poverty that is by opening the employment or entrepreneurship.

Entrepreneurship is separated from the world of education. Thus to be able to continue learning, University needs alternative solutions by integrating the value on entrepreneurship in the learning process through the development of production-based learning model. The concept is being offered in the learning process for each material whereby University students are able to produce products that are innovative and creative as well as acceptable for the market through the stages of logical and meticulous analysis, which further processed into creative new ideas, innovative and accepted in the market both in terms of planning skills, decision skills & execution skill. The development of production-based learning model will be able to enhance the

entrepreneurship passion of the students and graduates of the Faculty of Engineering of UNP.

2. Research Objectives

The purpose of this research is to 1) develop a production-based learning model to improve the entrepreneurship passion of student in the Faculty of Engineering UNP, 2) implement the production-based learning model to improve the entrepreneurship passion of student in the Faculty of Engineering UNP.

3. Overview of the Production-Based Learning Model

The model is a conceptual framework that are arranged in a logical and systematic sequence as a guide in the conduct of an activity, while the method and approach are different ways or strategies for the implementation of learning, with the aim of involving active participation of learners during the process of his/her education. The following will be discussed regarding the model of learning and development procedures as well as some methods and learning approaches that fit in any learning model.

Prawiradilaga (2008: 33) refer to model as a regular work procedures and systematic thinking, containing descriptions or explanations of a concept. While Sardiman (2007) interpret learning as a process of interaction of educators with learners who can encourage them to study actively, participatory, interactive methods, approaches, tools/media, and an appropriate learning environment. Vienna Sanjaya (2006: 120) defines learning as the basis for the process of adding information and new capabilities. Therefore, production-based learning model is defined as the procedures or steps that need to be performed by the educator to facilitate learners to actively learn, participate and interact, with a competency-orientation to produce a product either goods or services required.

4. Review about the Passion for Entrepreneurship

A person's passion for entrepreneurship can emerge after going through a process influenced by internal factors such as internal motivation, the spirit of working hard, and other positive potentialities. According to Suranto (2012) a student entrepreneur passion is having the ability to see opportunities, are professional, and with the following characteristic: (a) able to write well; (b) the entrepreneurial awareness; (c) the spirit of entrepreneurship; (d) explore the advantages and covering their drawbacks; (e) has a business network and building access to the other party; (f) have the mental self help; (g) creative and innovative; (h) self-confidence; (i) the tenacious and diligent; (j) do not easily give up. Furthermore Puspitasari (2007) stated that entrepreneurial spirit is the passion and the entrepreneurial attitude at the start of the process of creative, innovative people who have an entrepreneurial spirit and attitude, characterized by the attitude of the confident, optimistic, full of initiative, commitment, results-oriented, energetic, insightful, brave leadership, appear different, dare to take risks, and be ready with a challenge.

While according to Dadang (2008) an entrepreneur is a person with "the skill to convert dirt and wrecks into gold". According to him people with skill to convert dirt and wreckage to gold, have three main meanings. The first is the occurrence of a change in the creative means: from dirt and wreckage that are worthless and thrown by people into something that has a greater value. Second the result of the changes have commercial value, not just regarded as a great work but also have a high market value. Third to get gold an entrepreneur can start it from the dirt and wreckage that do not have value, in other words with zero. In addition, the individual understands the mind set of entrepreneurship.

5. Research Methods

Based on the background and the outline of the problem, the research conducted is a developmental research. This includes research to develop and produce new products in a system of learning that will be applied to learners as a user (users). Needs analysis was conducted which includes an analysis of the learning infrastructure and facilities, the needs of students, student characteristics, analyze the ability of educators to face obstacles during learning. Main concepts for the research were set by the researchers and educators integrate them in their lectures. The research was conducted on electric circuit teaching courses from January – June 2013. In the evaluation stage, educators and students answered a questionnaire and an observation sheet given to them. The research was implemented in two stages; a limited group test and a large group test which aim to see the practicality and effectiveness of the products developed. Responses regarding the suitability of the products were obtained after the students gave their response based on suggestions and feedback for correction of the product.

The procedure for the development of production-based learning model is as follows:

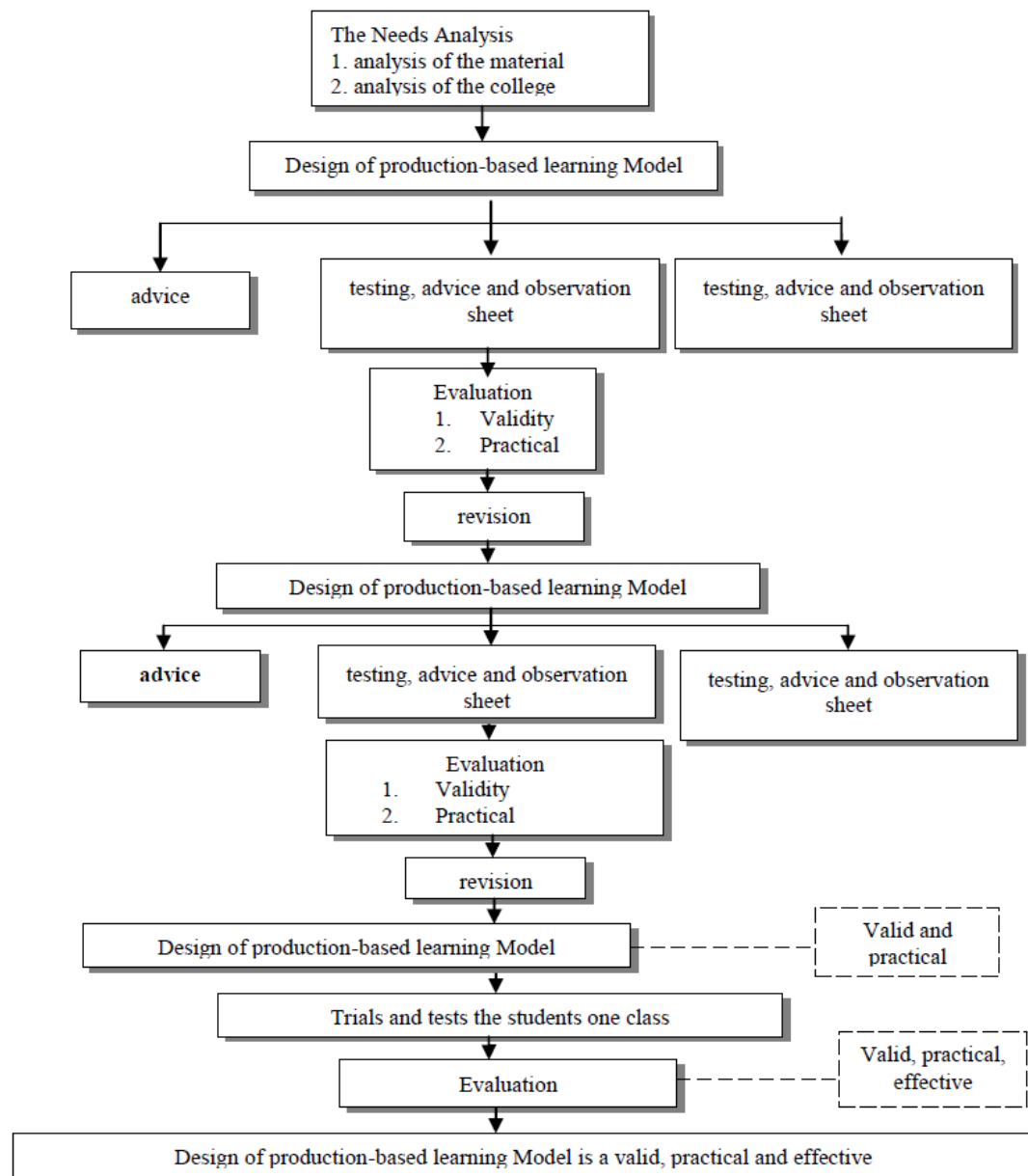


Figure 1. Diagram of the stages of the development of production-based learning model (Adapted from Akker,1999)

30 students studying in the electrical engineering program in the Faculty of Engineering, UNP were the first cohort for this research. Three research instruments that were developed to collect data for this study are as follows:

- 1) Validation questionnaire for model production-based learning
- 2) Practical observation score sheet
- 3) Effectiveness questionnaire for model of learning-based production.

Data analysis used in this research is descriptive data analysis techniques, which describe the validity, practicality and efficiency of use of production-based learning model.

6. Results

The results for this research can be viewed from the four major indicators that would point to the student competence in the field of practical electrical circuit, which produces the product. The four aspects studied in this research are: 1) the indicators of students entrepreneurial passion: creative, innovative, motivation, 2)

indicator of vocational learning: learning tools, methods and media, learning situations, 3) indicator of production: tools and materials production, calibration, testing and revision; the basic development indicators of entrepreneurship (business plan): market need analysis, packaging skill, marketing skill.

Table 1. The frequency of testing indicators of student entrepreneur

| Indicators of student entrepreneurship passion | Test I | Test II |
|--|------------|------------|
| Creative | 63% | 80% |
| Innovative | 65% | 78% |
| High Motivation | 70% | 85% |
| Average | 67% | 81% |

Table 1 show that the implementation of test indicators during Test I is average (67%) meaning enough information is received and increased to 81% (Test II) meaning good information. Results showed that increasing student entrepreneurship passion is an ongoing process and need to be backed up with plenty of sources and references for positive development of the students' entrepreneurship.

Table 2. The frequency of testing indicators of vocational learning

| Vocational learning indicators | Test I | Test II |
|--------------------------------|------------|------------|
| Learning devices | 70% | 91% |
| Methods and media | 68% | 89% |
| The learning situation | 66% | 85% |
| Average | 68% | 88% |

Table 2 show that implementation of test indicator for vocational learning in teaching electric circuit in Test I is average (68%) meaning enough information and increased to 88% (Test II) with very good information. Results show that the process of vocational education in electrical engineering at the Faculty of Engineering, UNP, in general is good but on the aspect of a learning situation there are still not many practical learning situations due to the atmosphere of comfort in practical work is still not customary.

Table 3. The frequency of testing indicators production

| Production indicators | Test I | Test II |
|--------------------------------|------------|------------|
| Tools and materials production | 70% | 95% |
| Calibration | 50% | 75% |
| Testing and revision | 63% | 80% |
| Average | 61% | 83% |

Table 3 shows that implementation of the testing indicators on a product is average (61%) in Test I and increase to 83% (Test II). Results also show that implementation of the calibration is slightly average because students still lacks the accuracy and thoroughness.

Table 4. The frequency of execution of basic development indicators test entrepreneurship (business plan)

| The basic development indicators entrepreneurship (business plan) | Test I | Test II |
|---|------------|------------|
| Market need analysis | 66% | 89% |
| Packaging skill | 72% | 93% |
| Marketing skill | 50% | 69% |
| Average | 63% | 84% |

Table 4 shows that the overall basic development indicator for entrepreneurship (business plan) is average (63%) in Test I and increased to 83% in Test II. Data also showed that development of entrepreneurship basics involved market need analysis, packaging skill and marketing skill. Of the three, marketing skill scored lowest as marketing skill involved special needs such as communication and oratory skills, but it is constrained by the implementation of learning; whereas, in the aspect of market need analysis in general student already understand the concept. It can be seen from the products which already exist in the society, with good quality and reasonable price offered.

7. Discussion

Based on the results of the research, there is an increase in all aspects studied between Test I and Test II. Therefore the increase shows that the application of production-based learning model with the entrepreneurial approach seems effective. Test results of 30 students show that 9 students (30%) have very good learning results, 17 students (57%) have good learning results, and 4 students (13.3%) have considerably good learning results. Thus the production-based learning model developed is effective when practice in the teaching of students from electrical engineering education program of Faculty of Engineering UNP. The practicality of this model reflects the ease in implementation for the students, as illustrated in Figure 2. In this model, student are required to develop creativity and innovation so that the resulting products have added value and renewable.

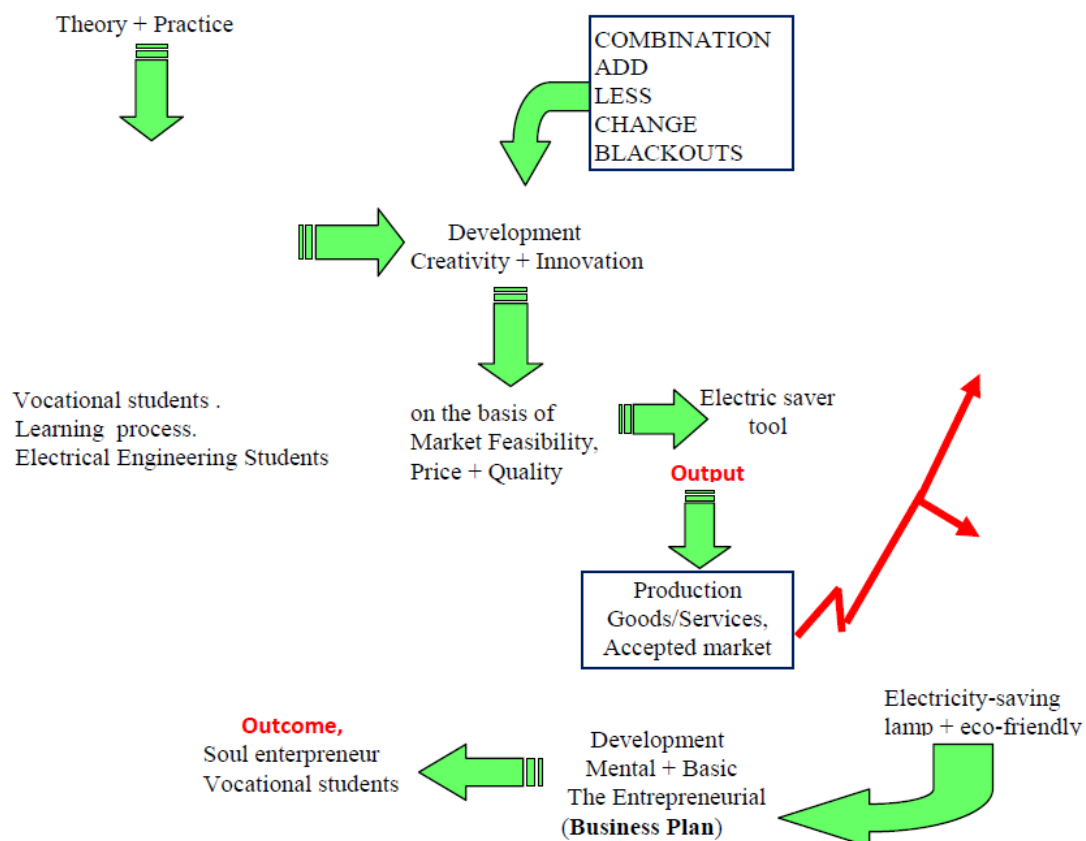


Figure 2. Production-based learning model

8. Conclusion

Production-based learning process during lecture or workshop provides increased quality and meaningfulness of learning. The experience of learning that student's associate with work practice or the work piece exactly in accordance with the standards and specifications of the field. The learning process gives impact on the increased interest in entrepreneurship among students. In addition, learning activities provide increased insight into the impact on cognitive, psychomotor skills and attitude in their work, thus this model is deemed right to be used in the effort for improving the entrepreneurial interests among students.

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