Designing Production Based Learning as a Basic Strategy for Creating Income Generating Units at Universitas Pendidikan Indonesia

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Abstract. The establishment of Universitas Pendidikan Indonesia (later to be referred as UPI) Statute as a State-Owned State University (PTN-BH) has implications for UPI requirements. One of them is the need for UPI to generate an Income Generating Unit (IGU) of at least IDR 100 Billion (one hundred billion rupiah). This requirement is considered difficult since UPI is one of the universities whose focus is on the world of education and not the business and industry. Surely this becomes the thinking of the entire academic community to make a breakthrough by optimizing their potential. This study aims to find the pattern of learning practice that produces economic value products as one indicator of IGU value achievement as an effort to support UPI as PTN-BH. Learning strategy is done by designing and implementing the production base learning (PBL) approach as the basis strategy for the development of production units capable of becoming IGU in UPI. The research method used refers to research and development methods with adjustments taking into account the effectiveness in validating and conducting field model trials. The result of this research is the basic design of PBL model as the development strategy of production unit in the achievement of IGU UPI PTN-BH.

1. Introduction
The Statutes of Universitas Pendidikan Indonesia (UPI) as state-owned universities (PTN-BH) stipulated by Government Regulation No. 15 of 2014 have a major impact on the overall activities of education in UPI [1]. It is characterized by various policies within the context of authority in organize and conducts educational and educational finance processes within the university. One consequence of the funding aspect is the demand from PTN-BH to generate income of 100 (one hundred) billion rupiah in one budget year. Obviously this becomes the thinking of the leadership and academic civitas to programmatically able to direct the resources owned to increase the income generating unit (IGU).

Based on the analysis of potential resources owned by UPI in addition to human resources is the presence of laboratories and workshops owned by UPI in each faculty unit. One of them is in the Faculty of Technology and Vocational Education with 6 (six) departments that have a number of laboratories and workshops. The Department of Civil Engineering Education is one of the departments in FPTK having several laboratories (hydraulics, structure, transportation, soil mechanics, soil and computer sciences) and building workshops (Wood, Concrete, and Steel / Plambing). Of course the potential of this resource can be optimized in addition to special to serve the lecture students can also be developed unit services and production. In the context of technical and vocational education, learning outcomes of learners is the mastery of a set of work competencies. Technical and Vocational
Education and Training (TVET) refers to education and training that prepares persons for gainful employment [2].

Optimization of its resources certainly does not interfere with the learning process, but synergistically by compiling the lectures, especially the workshop in addition to practicing the skills of students in the production process also produces products of economic value. Moving from this problem, in the study program of Engineering Education Building practicum lectures in building workshops are designed learning practices that bring closer to the situation and conditions in the field or industrial world.

The learning of best practices in technology and vocational education is the one that leads to the pattern of work developed in the industry. Of course, when done in the industry is not possible, but can be done by setting workshop as a miniature of the industry. The learning pattern must follow the concepts done in the industry, so that the practice lectures in the workshop are selected and designed with a product-based learning approach (PBL).

The importance of this PBL approach is to provide meaningful experience for the students of the Building Engineering Education in mastering a set of competence skills in the production process. The implementation of production based learning with entrepreneurship approach using workshop based lectures, qualitatively improved the quality and meaningfulness of the learning [3]. In addition, this research is directed to form a model of development of production unit which is developed based on workshop, where one of them is in wood workshop on lecture Practice of Wood and Practice of Furniture and Finishing Technique. The products produced in this course will refer to the standard product that is selling value so that it can be directed in achieving economic value that impact on the achievement of IGU both in study program and university in general.

2. Methods
The method used in this research refers to research and development methods. In its application make adjustments taking into consideration the effectiveness in validating and conducting field model trials. This method is chosen in accordance with the characteristics and objectives, namely to produce the form of production base learning design. Research and development is a process used to develop and validate educational product [4].

Based on the research objectives and the factual conditions in the field and the consideration of the feasibility of the research, then of course the steps developed by Borg and Gall should be adjusted. Therefore, in this study modification includes the following stages.

2.1. Introduction study stage
In this first phase, it begins first with literature study and field study as a study to know the approach of PBL and wood products in the field. The literature study is intended to understand the subject related to the models, approaches and learning methods used in practical learning in the workshop. In addition it also refers to the search and search references of research results that have been done previously that have a close to the topic of research that we will do.

While the field study was conducted by survey approach and descriptive documentation study that describes the condition of what is about the variables to be studied. The main purpose of field study is to collect information on as many variables as possible. At this stage will be traced all aspects in the implementation of practical learning that has been implemented as a basis in determining the design of PBL as an effort to lay a solid foundation in its implementation in the lecture of wood working practices.

2.2. Planning stage of PBL design
In the planning stages starting from the preliminary study results include findings on the practical methods used, the products that have been produced and the factual condition of practicum learning in the Wood Workshop. Then a study of similar research results that have been done in the application of
methods and procedures practical learning. Then a series of planning activities of research were prepared.

Stages of production-based learning design that is implemented schematically in this study as the following table 1:

Table 1. Stages of preparation of PBL design

| NO | PHASE OF ACTIVITY |
|----|-------------------|
| 1  | Review of the purpose of lecturing on woodworking practices in the curriculum and syllabus |
| 2  | Preparation of the scope of teaching materials / teaching materials |
| 3  | Preparation of learning tools |
| 4  | Preliminary drafting of production-based learning design |
| 5  | Prepare the job sheet framework or worksheet for each practice product |
| 6  | Preparation of draft observation sheet on PBL process |
| 7  | Drafting of process and product assessment sheets |
| 8  | Planning of processing techniques and data analysis of research results |
| 9  | Planning the scenario stages of applying the PBL approach |
| 10 | Determination of the object / respondent for the application of the PBL approach |
| 11 | Practice lessons based on PBL design |
| 12 | Observations and assessment of PBL processes on individual/ student groups |
| 13 | Assessment of product quality practices based on specified product criteria |
| 14 | Analysis of the economic value of products and product development opportunities as part of the development framework of production units |

2.3. Development stage

The next stage is the development of PBL designer, Job sheet, Observation Sheet and Processing and Product Assessment Sheet by validating in the form of pilot design of PBL approach and consulted to vocational education and training expert group as well as educational instructor until final draft from the concept of the model of the developed model instrument.

The development of the model at this stage of development is done by using judgment technique and expert judgment to validate PBL design concept. Then empirically validate by the education practitioner about the indicator's load and the items of the process and product valuation instrument. At the development stage, also conducted planning process assessment of products. Based on the design made, the researcher will use this application program only by filling out the assessment scale columns on each item of assessment on the process with the marking of Check (V). Systemically, the performance values of each aspect and each indicator will be seen, as well as the existing gap values obtained by comparing product performance with product standards.

3. Results and Discussion

3.1. Design validation model PBL

Validation of PBL model concepts using expert judgment in the study environment of Building Engineering Education includes lecturers, instructors, and laboratory educational institutions (PLP) of building workshops. The result of consideration is the input received to reinforce the concept of PBL model design in the practice lecture directed at the creation of the Income Generating Unit (IGU) unit within the study program environment.

After the improvement and refinement, the concept of PBL model then discussed again to strengthen the concept of the concept of PBL model. Based on the results of discussion and review of the concept of the model that has been improved, the concept of PBL model can be accepted and
considered to meet the rules of building the concept and as a reference in making design tools PBL model.

3.2. Empirical validation design build model PBL

The design of production base learning that has been tested, then empirically validated to obtain information about the performance and value of implementation gap implementation of PBL approach, so it will be faster also determine the decision to improve the implementation. The following is a plan for stages of PBL implementation based on validation results that have been done, namely:

- Learning about the selection of wood tools and materials
- Learning about the types and criteria of processed wood products
- Learning about working techniques from the beginning to finishing the product
- Learning about work safety implementation in PBL
- Practical learning begins from material selection to finishing processed products
- Observation and assessment of PBL processes on each individual / group of students
- Assessment of product quality practices generated based on specified product criteria
- Analyze the economic value of products and product development opportunities as part of the development framework of production units

Empirical validation for the design of PBL model is directed to obtain data about the appropriateness of PBL model design with its implementation in the practicum lecture. Based on the validation, it is found that the aspects of the design developed in the PBL syntax are seen in accordance with the characteristics of the purpose of the course, the lecture material and the learning achievement of the learners. is considered to represent the whole process of curriculum implementation. This study reinforces the importance of implementation PBL in vocational education with the syntax of learning include: (1) analysis of curriculum and learners characteristics, (2) identification and product analysis, (3) creating important questions about product, (4) questions mapping, (5) analysis of equipment and material needed of the product which was going to be made, (6) making schedule of implementation of making product, (7) process of making product, (8) evaluated regularly, and (9) creating business plan [5].

Nevertheless, there are some things to consider, namely the validation is still in a limited trial so it has not been used in all lectures in one semester. Thus it does not cover the entire course material taught in one or two courses so that it still needs to be developed and expanded in its implementation as part of competency learning model.

Empirical validation conducted from trial results in practice lectures for four lectures on one competency or one discussion, provides an assessment that all aspects, indicators and items are evaluated both on the planning and implementation dimensions are in accord with the improvement to be developed again in the lecture practice as a whole. Thus, it is necessary to carry out another large scale trial and practice for one semester so that a PBL model can be constructed which can be used to increase the possibility of developing the existing production unit in the Building Engineering Education study program.

The following are the products resulting from trials on the application of PBL to lecturing on wood working practices (see figure 1).
3.3. *The framework of establishing a production unit as an IGU strategy*

The existence of UPI as PTN-BH with one of the demands to produce an IGU value oriented on institutional strengthening and learning becomes something conditional on the role of UPI. Various steps that have been developed either through the BPPU established under the UPI Statute to optimize the resources owned by UPI. One of them is to optimize the resources of infrastructure facilities that can be optimized in addition to lectures can also be used to get the value of profit or input in the form of funding.

Facilities owned by FPTK UPI with various laboratory devices and workshops provide basic capital for the development of IGU UPI. The current practice is optimized for lectures only so that many are not used at certain times. Even though the practice model produces a product but not directed how the product will be used and for whom.

UPI position and funding demands collected apart from funds from the central government and the community, then the opportunity to optimize the infrastructure becomes a necessity. However, it is necessary to integrate a practice lecture model that leads not only to the achievement of lecture objectives and competencies to be achieved, but also how to make efforts to market the product of lectures into financial value added to increase lecture financing. The model developed in PBL design is basically to provide a foundation for developing a special production unit established in the environment of Building Engineering Education study program.

Stages of establishment of wood processing units developed from the results of this PBL modeling is done with the following steps:

- Determination of system and mechanism of establishment and management of production unit based on provision as determined by BPPU UPI.
- Determination of the type of processed wood products for the interior of buildings, furniture, and building component materials (frames, doors / windows, balustrade) that can be produced in wood workshops.
- Determination of quality and price of various processed products produced to see the needs of the community, especially in the campus environment through research of product standards and market price.
- Preparation of the Business Plan by the task force of the production unit as a direction in developing the production unit as part of duty to develop the revenue value of the IGU Building Engineering Education study program.
- Determination of assigned task forces to carry out the management of production units based on legal umbrella developed by BPPU UPI with transparent and accountable principles.

*Figure 1. Some furniture products from practice lectures*
4. Conclusions
This affirmative study is emphasized as the basis for the development of a production-based learning model. Thus the extent of the validity is limited to constructing a PBL modeling framework that is piloted in one or two practical courses only. Thus, the next stage of the research will be conducted to develop a valid and reliable PBL model for the overall learning of the practice lecture.

Based on preliminary research results and limited trial this obtained the following conclusions:

- Designed forms of production-based learning in lectures at workshop buildings have been limited in validation.
- Stages of implementation of the PBL approach in producing practicable products of economic value have been achieved on a limited product scope.
- The production unit framework in the workshop as part of the strategy of achieving the value of IGU for UPI as PTN-BH is based on the result of the research which is conducted based on the rule of law and mechanism stipulated by BPPU UPI.

References
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