

The Development of Problem Based on Learning Model Course at the Introduction Macroeconomic Subject to Improve Critical Thinking and Competency of Student at Department of Economic Education Unimed, Medan, Indonesia

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Abstract: Educational institutions have not been able to produce alumni who have professional competence, either in terms of knowledge, skills or critical thinking skills. This is because learning is more theoretical, just touching on the level of introduction of the norm and not at the level of internalization and action in real life every day. This research aims to improve the quality of learning and find the design of learning models Introduction to Macro Economics through problem-based learning model. Specifically the purpose of this study is to: (1) identify instructional needs Introduction to macroeconomics (2) develop instructional design that can be applied in lectures (3) analyze the effectiveness and efficiency of the learning model that has been developed so that it can be used as input for the manager and lecturer. This developmental research is conducted on Unimed campus. The population is all the students in a class who take the Introduction to Macro Economics subject at the Department of Economic education in 2016. The sample is determined by one class in that determined by purposive random sampling. The sample class is used for applying and testing the learning model. To achieve the expected objectives in this study research and development are used. Determining the feasibility of the model is conducted with the indicators of validity, practicality, and effectiveness. The effectiveness of the model is measured by one to one evaluation and limited learning. The improvement of critical thinking is by comparing the value of critical thinking scores before and after application of this model. The results of this research have obtained output in the form of model development, student worksheets and problem-based teaching materials. Based on one-to-one experiment, it is found that this problem-based learning model is effective in improving the students' competency and critical thinking.

Keywords: learning model; competence; critical thinking; students

Date of Submission: 28-09-2017

Date of acceptance: 23-10-2017

I. Introduction

Each lecturer hopes that the learning activities he undertakes can achieve the goals which are set with effective, efficient, interesting and fun for the active learning process form to the students. To realize that hope, the lecturers will develop the design of learning in accordance with the experience, knowledge, skills and all available resources, which support the optimal achievement of each learning activity.

The Introduction to Macro Economics subject is part of the curriculum which is the compulsory basic course in Economics Faculty (FE) of Unimed with 3 credits. This course becomes very important considering that it will be taught by students when they become teachers at high school/MA and SMK level. In the economic education of FE Unimed, learning the Introduction to Macro Economics subject is still centered on the lecturers and the students are passive and often feel bored. The consequences of this condition cause the students' critical competence and critical thinking ability to be less satisfactory. This condition can be seen from the results of students' learning in the last two years which shows that from 50 students only 3 students who get the value of A the rest get B and C. In addition in the lecture process, the researcher see when question and answer, the students rarely ask any questions and responding when they are asked, this indicates the students' critical thinking skills are lacking.

Based on in-depth interviews of 5 students from different classes, it was found that the cause of this condition is that the learning model is less interesting and challenged the students to think. The learnings have been expository, less interesting materials and learning media. This condition cannot continue to be ignored because it is feared that the profile of the department of economic education to prepare alumni to be a competent and professional economic teacher will not be achieved, and in turn will cause the quality of education will decrease. The efforts that can be done is to develop instructional design through learning model Problem base

learning (PBL) in which this PBL creates meaningful learning and can improve the critical thinking ability (Kemendikbud; 2014).

Many problems faced in the implementation of education in the Department of Economic Education, among others are the problem of graduate competence, the suitability between competencies possessed by market needs. This phenomenon is indicated by the number of alumni from the Department of economic education who lack the competence in the field and the waiting period to get a job is relatively longer.

During this time, learning is still theoretical with expository approach, not on critical thinking and analytical order so that the students' competence in the course of introduction to Macro Economics is not satisfactory. To improve the quality of this education, it is necessary to be addressed so that the problem of the students' critical thinking ability competence and can be increased. The department of economic education should be able to produce the teachers who have qualified competence and critical thinking skills. For that, the Introduction to Macro Economics learning needs to be more effective and efficient. The LPTK of Economics Education Department whose alumni are prepared to become professional teachers should be innovative as early as possible to learn.

Introduction to Macro Economics should be able to internalize attitudes, competencies and critical thinking skills, because one of the objectives of Introduction to Macro Economics learning is to educate the students to have a bold competence of basic knowledge about macro economics and able to analyze, criticize macro economic phenomenon in Indonesia.

This research was conducted to improve the quality of education and learning Introduction to Macro Economics and the macroeconomic competence development model as well as the students' critical thinking skills who have been running for this. More operationally, this study aims to: (1) identify the macro economic instructional needs desired by students of FE Unimed economic education, (2) develop instructional design of macroeconomic courses that can be applied in lectures in economic education majors, (3) analyze the effectiveness and efficiency of the learning model that has been developed so that it can be used as input for the manager and lecturer of FE Unimed economics education department.

The purpose of this macro economic course is to educate the students to have competence on basic knowledge of macro economics and to skillfully analyze and criticize the macro economic phenomena occurring in Indonesia. Besides, one of the profiles of the department of economic education is to produce a professional economics teacher at the level of SMA/MA/SMK. This Introduction to Macro Economics subject is a basic economic course that must be followed by every student who will be re-taught by the students when becoming an economics teacher.

The model of learning in the macroeconomic courses which is applied so far is generally conventional with expository expression. Whenever the learning model that has been maintained, it is feared that this learning objective will not be achieved and the profile of the department of economic education will not be realized which in turn will degrade the quality of education.

Therefore the research development of this learning model is urgent to be implemented when we do not want the quality of this education to be backward. This research becomes very urgent because the output of this research is a lecture material in the form of problem-based learning model, macro economic module, instructional media, project-based assessment that has not existed in Unimed Economic education department and other economic education majors of other universities in North Sumatera.

This developed learning model is a problem-based learning, which is an instructional model that challenges the students to learn to study to work together in groups to find solutions as real problems. This problem is used to link curiosity and the student analytical skills and initiatives to the subject matter. PBL prepares students to think critically and analytically and to seek and use appropriate learning resources (Amir; 2010) [1].

II. Literature Review

2.1. Model Development

Barbara (2000) [2] describes that development is the process of writing and manufacturing or producing learning materials. Instructional development is a management technique for finding solutions to instructional problems or in optimizing the use of existing learning resources to improve education. Dick & Carey (2009) [3] explains that the development of a learning system combines components of analysis, design, development, implementation and evaluation. Thus the instructional design produces a plan or blueprint while development produces a prototype/model. So design and development is an activity to produce something that can be emulated and imitated based on predetermined size.

In developing the learning model, some steps are needed such as: (1) identifying, (2) developing, (3) evaluating, and (4) revising. Then for development activities, it requires the following stages: (1) designing, (2) developing, (3) implementing and evaluating learning, (4) revising. Thus design as a foundation or developmental step requires activities: defining, designing, demonstrating, developing and presenting.

Learning model is a model of learning with the lecturing model that can help the students to get or obtain information, ideas, skills, ways of thinking and expressing ideas themselves. Joyce (2009) [4] explains that the learning model is to help students to get information, ideas, skills, values, thinking ability, and self-actualization which are also taught to the students how to learn effectively and systematically so that they can improve learning ability more easily and effectively in skills. The model can explain the more precise, complete and consistent relationship as well as the whole of an activity.

2.2 PBL Model

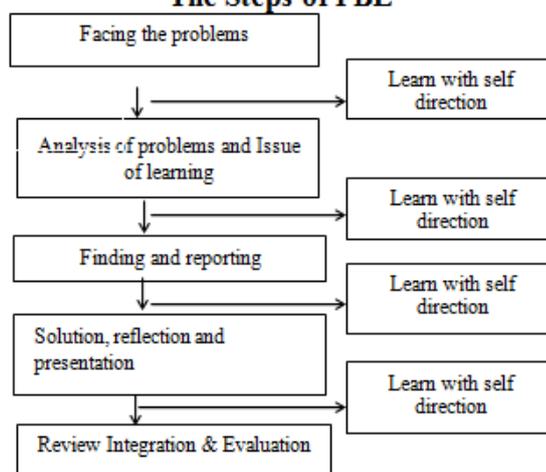
Problem-based learning is a learning strategy that is a learning solution designed to improve learning by bringing, delivering, requiring students to learn the content of teaching materials when solving problems. PBL model has been known since the time of John Dewey. This is in line with the opinion of Jonassen (2011) [5] that "Problem based learning is an instructional strategy. That is, it is an instructional solution designed to improve learning by requiring students to learn content while solving problems". Furthermore Howard Borrows and Kelson as quoted by Amir argue that PBL is a curriculum and learning process. Amir (2010) explains that in curriculum, it is designed the problems that require students to gain important knowledge, make them proficient in solving problems and have their own learning strategies and have the skills to participate in the team. Furthermore Sani (2014) argues that problem-based learning which the learning is delivered by presenting a problem, ask questions, facilitate the investigation, and open the dialogue.

Based on the above explanation, it can be seen that the learning material is mainly characterized by problems, and problems are given at the beginning of the learning. The problem presented is a problem that has context with the real world. The lessons from problem-based learning have three characteristics: 1) the lessons which focus on solving problems, 2) the responsibility in solving problems rely on the students and 3) the lecturers that support the process when the students work on the problem (Trianto 2009).

Based on the psychological point of view, the problem-based learning is based on the theory of cognitive psychology mainly based on the theory Piaget and Vigotsky (constructivism). According to constructivism theory, students learn to construct their knowledge through interaction with their environment. Furthermore Sanjaya (2011) suggests that problem-based learning relies on cognitive psychology that departs from the assumption that learning is a process of behavior change thanks to experience. Learning is not merely the process of memorizing a number of facts, but a process of conscious interaction between the individual and his environment. Through this process the students will gradually develop as a whole. With PBL students learn through real world problem solving efforts in a structured way to construct student knowledge.

PBL prepares the students to think critically and analytically, and to seek and use the appropriate learning resources. Jonassen (2011) explains that the PBL process is implemented through four learning steps: (1) students are grouped through groups of five to eight people to express their views on the issues. The group seeks to limit and to formulate the learning problems and objectives, identify the known knowledge and needs of activities they need, (2) carrying out independent learning activities where the individual students complete the billing tasks in order to understand the problem, and even the potential solutions. In this activity, the students collect and study various relevant sources and group reports, (3) the students share by communicating reports/learning outcomes in groups and listening to the existing problems, composing new or rejecting hypotheses, based on their learning outcomes, (4) at the end of the learning period, the students summarize and integrate the results of each group in an integrated way. The steps of PBM strategy according to Tan (2003) [7] can be seen in Figure 1.

Figure 1
The Steps of PBL



From the stages of the PBL process which has been explained by some expert opinions then in this research, the researcher applies the stages of PBL as follows:

- 1) The lecturers convey problems to students or students to file issues relevant to the topic to be studied.
- 2) The Students discuss the problems within the group. The group will clarify the truth and seek relevant relation concepts and brainstorm based on their initial knowledge in an effort to understand the problem and propose solutions. Identify things they do not yet understand and need to learn to solve problems.
- (3) The students or groups make plans to solve problems. Group members share roles to learn facts and concepts or prepare for exploration activities,
- (4) Each student performs information tracking or observation based on the tasks set out in the group discussion. Data and information can be obtained from libraries, internet, observations, interviews and other sources,
- (5) The students return to group discussions and share information. Information or knowledge gained is used to solve the problem under study. Group work can be done in the laboratory, in the classroom to investigate related phenomena through focus group discussions,
- (6) The group presents the solution of the problem to classmates. Presentation of problem solutions should be pre-directed and other friends responding to the work being delivered,
- (7) The group members review the problem-solving process that has been done.

2.3 Critical Thinking in Macroeconomics

The standard of competence expected from this Introduction to Macroeconomics course is (1) developing students' basic thinking skills on subjects in macroeconomic issues by using various analytical tools commonly used in macroeconomic theory descriptively, graphically and mathematically so as to make logical and critical reasoning on macroeconomic issues, (2) respecting/being critical to various macro economic problems and respond wisely based on the skills they have, (3) becoming the basis of thinking for the further development of macro economic knowledge.

Based on this competency standard, it is clear that in learning Introduction to the Macro Economy besides the need for competence, thinking critically is also required. According to Paul & Elder (2005), critical thinking is a way for a person to improve the quality of thinking through the technique of thinking system and generate intellectual thought in the ideas that are initiated. Someone who thinks critically will be able to answer the important problems well. He will think clearly and precisely. In addition, he can use abstract ideas to be able to model problem solving effectively.

Some criteria that we can make as a standard in this critical thinking process are clarity, accuracy, precision relevance, logic, breadth, depth thinking (depth), honesty, completeness of information and how the implications of the solution. Critical thinking is a cognitive activity associated with the use of reason. Learning to think critically means using the mental process such as, observing, categorizing, selecting, and judging/deciding. The ability to think critically provides the right direction in thinking and working, and helps in determining the relevance of something with others more accurately. Therefore, critical thinking skills are needed in problem solving/solution search.

The main purpose of developing critical thinking in learning is to change the paradigm of teaching to the learning paradigm and from behaviorist toward constructivists, from the lecturer-centered learning to student-centered learning. One of the lessons relevant to this is PBL.

III. Research Methods

This research uses developmental research method. The purpose of developmental research according to Borg & Gall (2003) [6] is to develop and validate educational products. Furthermore Borg & Gall, educational products are not only material, such as textbooks, learning videos, etc., but are also included to refer to existing ways and learning processes such as learning methods or organizing methods learning. Referring to the two opinions above, this research uses a developmental model adopted from Dick, Carey and MPI Suparman, (2002). The stages of developmental implementation consist of: 1) Pre-development 2) Initial development, 3) Developmental model with field trial and 4) Validation and application models. While the components covered in the model refer to the components of the learning model proposed by Joice, Weil, & Calhoun (2009), namely: (a) syntax, (b) social system, (c) reaction principle, (d) support systems, and (e) instructional and accompanist impacts.

Based on the guidance of Borg and Gall by referring to the system approach to develop a MPI instruction design that Suparman proposed, this research intends to produce a product in the form of model of learning system Introduction to Macro Economics of problem-based economic education program consisting of instructional design, teaching materials, LK. The stages of development are as follows: (1) Pre-development stage (needs assessment), (2) Initial development stage (model/material design) (3) Developmental model stage (revision-test) (4) Final development stage (validation and application of the model).

The stages of the developmental research are applied on the basis of the consideration that the developmental research of this learning model is a cycle that can be summarized into the four stages above.

3.1. Data collection technique

The data collection in this research is grouped into four, namely: pre-development, initial development, model development and validation. In each stages of the research, the specific data collection techniques in accordance with their respective objectives. In the pre-selected techniques of the questionnaire, observation and documentation and literature review. Likewise, for the second stage up to the fourth stage.

Questionnaires are mainly used to reveal 1) preliminary study on the implementation of practical learning that has been done for students and lecturers in the Department of Economic Education, 2) assessment of Introduction to Macro Economic learning materials, (3) the applicability of learning model for the students, (4) the development of a problem-based learning model at Economic Education Department of Economic Faculty of Unimed. The observation is mainly used to see the implementation of learning by lecturers, the student skills, the facilities support. At the development stage there are two steps related to the data collection techniques, namely limited trials and major trials.

IV. Results And Discussion

4.1 Needs Analysis Results

In learning introduction to macroeconomic, the basic competence is usually provided by the Department/study program of Economic education prepared by the KDBK Economic team. Introduction to Macro Economics as a course that prepares the students for the basic concepts of Macro Economy, real issues related to macroeconomics and tries to find solutions that need to be prepared optimally so as to ensure the creation, experience, real knowledge that students need as prospective professional teachers.

Based on the instructional analysis of the subject Introduction to Macro Economic, the competence which is expected after following the learning process are: the students are expected to be able to analyze various problems and variables that occur in macroeconomic and policies taken by the government, both fiscal policy and monetary policy in overcoming and improving national economy. Thus the special competencies that must be mastered by the students are: (1). describing the concept of national income calculation, (2) analyzing the balance of national income of two and three sectors, (3) describing money, financial institutions and money supply, (4) analyzing fiscal and monetary policy, (5) analyzing inflation and unemployment, (6) analyzing the Economic growth. The ability that the students need to be able to solve the problems that are directly related to daily life and real world can be explained in Table 1.

Table.1
Introduction to Macroeconomics Competence

No	Basic Competence	Materials
1	Describing the concept of national income calculation	<ul style="list-style-type: none"> • Circular flow of income • Approach to the calculation of national income • Basic understanding and calculations relating to national income • The valid and constant GDP prices • The advantages and limitations of national income calculations
2	Analyzing the balance of national income of two and three sectors	<ul style="list-style-type: none"> • Two national income flows sector • The relationship between consumption and income • Consuming and saving tendencies • Example of calculating MPC and APC • Calculating MPS and APS • Consumption and saving functions • Investment function • Calculation of the balance of national income 2 sectors • Approach leakage and algebra injection • Two-sector revenue curve. • Change of balance and Multiplier • Determining the magnitude of the multiplier
3	Describing money, financial institutions and money supply	<ul style="list-style-type: none"> • Three national sector income streams and equilibrium requirements • Taxes and their relationship to consumption and savings • The tendency to consume and save marginally • Tax effects • Government expenditures and stakeholders • Government expenditure functions • Balance in a three-sector economy • National balance graphically • Proportional tax and income balance

		<ul style="list-style-type: none"> • Multiplier
4	Explaining money, financial institutions and money supply	<ul style="list-style-type: none"> • Definition and the characteristic of money • The function of money • Bank • The process of creating money in circulation • The Central Bank
5	Analyzing Macro Economic policies (Monetary and Fiscal)	<ul style="list-style-type: none"> • Monetary policy instruments • Effectiveness of monetary policy • Effectiveness of fiscal policy • The effect of tax on income and consumption and economic balance
6	Analyzing inflation and unemployment	<ul style="list-style-type: none"> • Understanding of Unemployment • Type of unemployment • Understanding of inflation • Type of inflation • Causes of infalction • Inflation calculation • Inflation and government policies • Phillips Curve
7	Describing the Economic growth	<ul style="list-style-type: none"> • The concept and measurement of economic growth • The need for economic growth • Determinants of economic growth • Theories of economic growth • Development issues in developing countries

4.2. Need Analysis Result of Learning Model

The initial information is intended as a foothold for the model development to be developed. This gathering of initial information is conducted in various ways such as by observing, interviewing and distributing questionnaires to the students and the lecturers involved in the course lesson of Introduction to Macro Economics. The respondents involved in this learning are the students and the lecturers. The 30 students are asked about the following matters:

No	Questions	Answers
1	1 Can you follow the Introduction to Macro Economics learning well and fun?	3
2	2 Do you think the students' competence or ability after following the course of Introduction to Macro Economics is good?	3
3	3 Does the teacher centered learning model for the normal Introduction of Macro Economics suit your needs? 2	2
4	4 Is the competence or ability achieved if the Introduction to Macro Economics learing by using the teacher centered models appropriate to your experience?	2
5	5 What do you think if the Introduction to Macro Economics learning uses an active student learning model (Student centred) to look for Macro Economics sciences and be able to apply it to macro economics problems in the real world or problems faced daily?	4
6	6 Will the introduction of Macro Economics learning by applying Problem-Based Learning Model (PBL) be easier to achieve the competence when it is compared to other models that you have been experiencing?	4
7	7 Do you have the opportunity to identify, analyze and provide solutions to address the macro economic issues?	2
8	8 Has the Introduction of Macro Economics been able to train the students to think critically? 2	2
9	9 In your opinion, will the application of problem-based learning models in Introduction to Macro Economics train the students think critically?	4
10	10 What competencies do you get after attending lectures Introduction to macroeconomics has been satisfactory?	2

4.3Expert Test Results

To review the products of learning materials of Introduction to Macro Economics, the experts used materials experts, design and media learning experts. The material experts, after the learning materials development product was made, then three material experts were asked to assess the learning materials. Based on the assessment, the results obtained suggestions and responses for product improvement include: (1) adding material on the concept and history of economic development as well as the macro of open economy (International) and state welfare (2) need to add more examples and exercises, (3) images/curves need to be made with an attractive look, (4) the data displayed should be actual (current) data.

The learning design experts use the results of the assessment obtained suggestions and responses for improvement of product development as follows: (1) need revision of ABCD components, (2), sufficient examples need to be added. The media specialists use the assessment results obtained suggestions as follows: (1) images/curves need to be improved (2) consistency of use of letters, (3) staining/coloring. Furthermore, the researcher has refined input from the expert according to the suggestion.

4.4. One-to-one Test Results.

The results of the development products have been revised based on the input from the experts, then individual evaluation (one to one) to the students is conducted that are high ability, moderate and low. Based on the results of this trial, it is obtained the input, among others: examples and training needs to be added, refining learning media improved. The learning model is very useful to improve the students' competency and critical thinking. All the suggestions from the individual experts and trials have been accommodated and revised for product perfection.

The developed learning model in the course of Introduction to Macro Economics is a model of PBL and teaching materials in the form of LK, Module and Media. Furthermore, after the learning device is completed, the formative evaluation is conducted with stages 1) expert test, 2) individual test. However, limited and field trials have not been undertaken since this study will continue in the second year (2017) to come.

The results of expert test and one-to-one tests show that the developed PBL model is in *very good* category. The results of the assessment of the three students as individualized trials provide an excellent assessment category and state that the PBL model developed effectively improves students' critical and critical thinking in Introduction to Macro Economics. The results of this study are in line with the research of Maxwell, Nan L; Mergendoller, John R; Bellisimo [8] who explains that macro economic learning with PBL compared with traditional class is better and more effective. They found a strong evidence of instructional interaction with such teachers, for some teachers, the macro economic learning using PBL has increased but, for others, the learning has improved by using more traditional learning methods. Maxwell's research sees that there is no significant difference in learning under two learning strategies. The results show that the problem-based instruction can improve the students' learning if the teachers are trained well in PBL techniques.

V. Conclusion

Based on the problem, the purpose and the result of data analysis and the discussion obtained in this research can be summarized as follows (1) based on the preliminary survey of the learning process Introduction to Macro Economics during this time found less optimal in improving the students' competence and critical thinking. (2) the development of learning model is needed especially the development of problem-based learning model that can be applied to the students of Unimed Economics education department. (3) the revised results on the PBL model for Introduction to Macro Economics have been undertaken so that based on expert reviews and material experts, design and learning media experts stated that the PBL model Introduction to Macro Economics is feasible to apply. (4) Based on one-to-one evaluation, it is stated very well. (5) the implementation of learning by using PBL model gives easiness and the learning activities that vary and encourage critical thinking of students so that there is an increasing on the students' competence and critical thinking ability.

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Thamrin. "The Development of Problem Based on Learning Model Course at the Introduction Macroeconomic Subject to Improve Critical Thinking and Competency of Student at Department of Economic Education Unimed, Medan, Indonesia." IOSR Journal of Research & Method in Education (IOSR-JRME) , vol. 7, no. 5, 2017, pp. 56–62.