

Development of Micro Economic Theory

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Development of Micro Economic Theory Teaching Materials with ADDIE Model Approaches

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Abstract— This study aims to develop effective teaching materials for students in mastering the concepts of microeconomic theory. This teaching material development procedure uses ADDIE method, which consists (1) Analyse, (2) Design, (3) Development, (4) Implementation, and (5) Evaluation. The feasibility of teaching materials is based on the assessment of material experts and instructional material design experts, while the effectiveness of their use is based on the results of field trials. Based on the results of the study showed that the micro economic theory teaching materials developed are feasible to be used as teaching materials in students of the Economic Education Study Program with a material suitability level of 90 percent and the suitability of the design of teaching materials 90.48 percent. with an average score of 3.5 to 3.6, and the level of effectiveness of its use which is very significant in improving learning outcomes in both small classes and large classes.

Index Terms— Development of teaching materials, microeconomic theory, ADDIE models.

1 INTRODUCTION

Learning in tertiary institutions is based on the Indonesian National Qualification Framework (KKNI) as stipulated in Presidential Regulation No. 8/2012, and Law No. 12/2012 on Higher Education. As a national agreement, determining S1 graduates has a minimum "ability" equivalent to "learning outcomes" at level 6 KKNI [1].

The level and breadth of the learning material taken must master the theoretical concepts of certain fields of knowledge and skills in general and the theoretical concepts of specific sections in the field of knowledge and skills in depth [2].

Microeconomics course is one of the compulsory courses in the Economic Education Study Program that students must master as a basis for a broader study of economics. Microeconomic analysis is needed to study the economic behavior of individuals both consumers, producers in making decisions [3]. To study various fields of economics requires microeconomic and macroeconomic analysis [4].

Economic theory analysis examines the causal relationship of variables in the economy and the prediction of events due to changes in a variable if it changes. This concept becomes very important to be mastered by students of the Economic Education Study Program as a basis for the development of the economic sciences they study.

As one of the main theories in economic analysis, learning microeconomic theory requires mastery of analytical tools, such as graphs, curves, statistics and mathematics. Curves and graphs are instruments needed in economic analysis. Further analysis in the economy requires a study of mathematics and statistics as an analytical tool to gather facts and test the truth of the theory [4].

The success of learning is very much determined by the integration of the related elements in it, starting from the clarity of the curriculum, the accuracy of the learning design, lecturer professionalism, the readiness of student learning and the availability of learning resources and supported by the environment, adequate facilities and infrastructure.

Optimizing element support in improving the quality of graduates in the short term is to design efficient learning. Demands in learning microeconomic theory, in addition to understanding the concept needed proof through facts that are analyzed using graphs, statistics and mathematics so as to provide a clear understanding of a theory being studied. The existence of learning resources becomes very necessary to support learning with these characteristics, so students focus more on lecturers' explanations and conduct economic analysis exercises and can review material that has been learned from available sources.

The availability of teaching materials is needed in learning. By using teaching materials students more quickly understand the material and do the exercises and feel more prepared to face the subject matter [5]. The use of teaching material texts have a significant effect on improving learning outcomes [6]. With the development of teaching materials can facilitate the performance of lecturers and can motivate student learning independence [7]. By developing teaching materials can streamline learning and complete student learning outcomes [8]. Module development is very important for analyzing student characteristics, learning environment and other factors that influence learning [9].

There are many references or teaching materials used in learning microeconomic theory, but of the many references most still use illustrations that are less relevant to current economic conditions so that they are less attractive to students and make it difficult to understand them. Therefore, the development of microeconomic theory teaching materials must pay attention to the learning needs of students and be designed effectively and easily used in improving student

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understanding. One method that can be used [15] develop teaching materials as demanded for learning is the ADDIE model (Analyze, Design, Development, Implementation, Evaluation). The ADDIE model is proven to be a very useful teaching model in preparing learning material [10].

Development of teaching materials [1] using the ADDIE model produces teaching materials that are effective in guiding the design process that supports learning. Therefore, the ADDIE model can be adopted and used to produce effective and quality learning tools (Christian, 2019) [11]. Through the stages of the ADDIE model, it is possible for the developed learning media to be used in learning [12].

This condition encourages researchers to develop micro-economic theory teaching materials based on contextual matters so that they become an attraction to learn and provide convenience in learning them.

2 METHODOLOGY

This research is a form of development research that aims to produce contextual microeconomic theory teaching material so that it is effectively use [7] in the learning process. The model used follows the ADDIE model (Analyze, Design, Development, Implementation, Evaluation). This model helps instructional designers, develop any content and design learning that is efficient and effective [13].

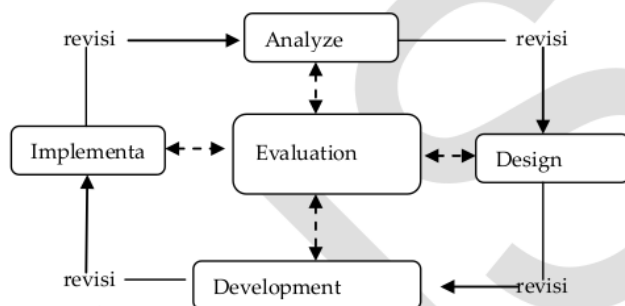


Figure 1: ADDIE Model Stage [10]

Stage I. Analysis includes: (1) the competencies achieved by students, (2) the characteristics of students about their learning capacity, knowledge, skills, attitudes and other related aspects, (3) course material in accordance with the demands of the competencies achieved.

Stage II Design refers to: (1) the use of teaching materials, (2) learning objectives, (3) learning methods, (4) learning evaluation.

Stage III. Development consists of: collecting teaching materials / materials, making illustrated drawings, typing and others. Teaching materials that have been developed are corrected for their compatibility with the context of the material by the material expert and the teaching material design by the instructional material design expert. With the following conditions:

TABLE 1
CONVERSION RATE OF ACHIEVEMENT [14]

Achievement Level (%)	Qualification	Information
90 – 100	Very good	No Need to Revise
75 – 89	Well	Revised as necessary
65 – 74	Enough	Quite Much Revised
55 – 64	Less	Much Revised
0 – 54	Very less	Revised Total

Stage IV. Implementation is carried out in small classes and large classes to determine its usefulness in the learning process for students.

Stage V. Evaluation is carried out formatively to the learning process. [3] Student learning evaluation results are used to determine the effectiveness of the use of teaching materials in learning, namely by calculating the increase from the first and second test after using teaching materials. The significance level of the increase in learning outcomes was analyzed using the t-test [15], with the following formula:

$$t = \frac{\bar{X} - \bar{Y}}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2} - 2r\left(\frac{S_1}{\sqrt{n_1}}\right)\left(\frac{S_2}{\sqrt{n_2}}\right)}}$$

Where, t: significance level, \bar{X} : average learning outcomes in the first test, \bar{Y} : average learning outcomes in the second test, S: standard deviation, n: number of sample members, r: correlation coefficient values.

The hypothesis built from this test is:

Ho: There is no significant influence of the use of microeconomic theory teaching materials on student learning outcomes

Ha: There is a significant influence on the use of microeconomic theory teaching materials on student learning outcomes.

3 RESULT AND DISCUSSION

The model of developing microeconomic theory teaching materials using ADDIE models begins with analyzing learning needs, designing teaching materials, developing teaching materials, implementing teaching materials and evaluating the successful use of teaching materials. Through these stages it is expected to produce effective and quality teaching materials to support the learning process.

3.1 Analysis Phase

The analysis phase is carried out to identify the learning needs of students who will be met in the learning process. The development of objective objectives is carried out to meet [1] needs of students [13]. Learning needs analysis plays an important role in identifying learning tasks that will be mapped into features such as Introduction, Tutorial, Demonstration, Practice and Assessment used in making the object-oriented

solution domain [11].

1. Competencies achieved by students

The competencies to be achieved by students from studying microeconomic theory are: (a) Understanding the concept of microeconomic theory; (b) Analyzing cases of demand and supply of goods; (c) Analyzing prices and quantities of equilibrium goods; (d) Analyzing the level of elasticity of demand and supply; (e) Analyzing the level of customer satisfaction; (f) Analyzing short-term and long-term production; (g) Analyze the use of short-term and long-term production costs; (h) Analyzing profits in a perfectly competitive market; (i) Analyzing profits on a monopoly market; (j) Analyzing profits in a monopolistic market; (k) Analyzing profits on the oligopoly market

2. Characteristics of students about their learning capacity, knowledge, skills and attitudes of students in the Economic Education Study Program:

- Students' learning capacity learns the basic concepts needed to learn more specific knowledge about economics through the analysis of economic variable data that are interrelated with one another.
- Based on SN-Dikti article 9, paragraph (2), students are required to master concepts theoretically in certain fields of knowledge and skills in general as well as theoretical concepts in special sections in depth.
- Having skills in applying basic concepts in developing deep scientific knowledge in economics
- Having a positive attitude towards his scientific field which is shown by sincerity, independence and responsibility in learning.

3. The course material in accordance with the demands of competence achieved consists of (a) The concept of microeconomic theory; (b) Supply and demand theory; (c) Theories of consumer behavior; (d) The theory of producer behavior; (e) The theory of production costs; (f) Patterns of economic activity in perfect competition, monopolistic, monopolistic and oligopoly markets.

Based on the analysis emphasized that the need for students to study microeconomic theory is to produce an understanding of economic analysis conducted by individuals who form a certain pattern as a basis for making decisions on economic activities to be carried out. Microeconomics involves decision making by individuals and small groups, such as families, organizations, companies and government institutions [16].

3.2 Design Stage

The design of teaching materials is done as an effort to study the materials needed in learning microeconomic theory. The process of designing instructional materials is based on: (1) users of micro-economic theory teaching materials, namely students of the Economic Education Study Program who have studied introductory courses in economics and economic mathematics, (2) abilities learned in learning microeconomic theory are analyzing cases the economic case mathematically,

statistically and graphically to support the conception of the microeconomic theory, (3) the learning method used is the Problem Based Learning method, (4) the evaluation of learning is done in essays.

At this design stage, the learning outcomes that are desired and the steps that must be taken are identified as well as the learning content to be used. By using the ADDIE model successfully identified the objectives and learning outcomes, the form of learning instructions to achieve learning objectives, and create lesson content [11].

3.3 Development Stage

Furthermore, at this stage the preparation of teaching materials is carried out, which includes the collection of contextual learning materials / materials (in accordance with current realities), making illustrated drawings, and designing assessment instruments.

To produce teaching materials that are suitable for use in learning, a product feasibility test is conducted according to the material expert and the instructional material design expert. Based on the results of the expert assessment of microeconomic theory materials, obtained the level of suitability of teaching materials reached 90 percent. Meanwhile, according to the instructional material design expert, obtained the achievement of the design of microeconomic theory teaching materials by 90.48 percent. If the suitability level of teaching materials developed reaches 90 to 100, then there is no need to revise [14]. Thus the teaching of microeconomic theory that has been developed can be used as learning material. Interaction between phases is very important in producing a quality design because it helps review and improve the next design version [11].

3.4 Implementation Stage

Material and design expert judgment is limited to content validity as teaching material. Implementation of teaching materials is done as an effort to determine the level of usefulness for students in the learning process both in small classes and large classes. In this study, the benefits of teaching materials are measured from the achievements of student learning outcomes after using learning materials for microeconomic theory that has been developed.

The trial use of the first teaching material was carried out in small classes with 10 students in two meetings. The second trial was conducted in a large class with 33 students. After using microeconomic theory teaching materials, students are asked to rate these teaching materials according to their experience, as shown in Table 2 below:

TABLE 2
STUDENT RESPONSES TO THE DEVELOPMENT OF
MICROECONOMIC THEORY TEACHING MATERIALS

No	Statement	Average score	
		Small Class	Big class
1	Interest in using teaching materials	3.5	3.6
2	Ease of understanding	3.7	3.7

	concepts		
3	Ease of understanding and applying analytical techniques in doing learning tasks	3.5	3.5
4	Increase participation in classroom learning	3.4	3.6
5	Preparedness facing learning	3.5	3.5
6	Speed of understanding the subject matter	3.6	3.4
7	Increased insight into the formation of market prices	3.6	3.5
8	Learning independence	3.4	3.5
9	The suitability of the questions with the subject matter	3.6	3.8
10	Improved understanding through work on practice questions	3.5	3.3
	Average	3.5	3.6

Source: Primary data processed

Based on Table 2, it shows that students' responses to teaching materials on microeconomic theory both in small and large classes give ratings of 3.5 and 3.6. That is, teaching materials developed microeconomic theory is considered very feasible to support the learning needs of students both in small classes and large classes.

3.5 Evaluation Stage

evaluation is carried out to determine the effectiveness of its use in meeting learning needs. The use of teaching materials is considered effective if it has a positive impact on improving student learning outcomes. Wilcoxon test is used to fulfill these interests because the data are not normally distributed. The Wilcoxon Test was used to determine the effect of the use of microeconomic theory teaching materials on student learning outcomes. Learning outcomes data consists of learning outcomes in the first and second stages. After being analyzed using the Wilcoxon test the following output is obtained:

TABLE 3 RANKS		N	Mean Rank	Sum of Ranks
Test_II -	Negative Ranks	2 ^a	2.25	4.50
Test_I	Positive Ranks	30 ^b	17.45	523.50
	Ties	1 ^c		
	Total	33		

a. Test_II < Test_I, b. Test_II > Test_I, c. Test_II = Test_I

Based on the SPSS output in Table 3, there were 2 students who experienced a decrease in learning outcomes from the first test to the second test, with Mean Rank = 2.25 and Sum Rank = 4.5. Students who experienced an increase in learning outcomes from the first test to the second test, as many as 30 people, with an average increase of 17.45 and a total increase of 523.5. While students who did not experience an increase in learning outcomes from the first test to the second test were 1 person.

Wilcoxon Test Output shows the level of effectiveness of the use of teaching materials to improve student learning outcomes, as shown in Table 4 below:

TABLE 4
TEST STATISTICS

Test_II - Test_I	
	-4.911 ^b
Asymp. Sig. (2-tailed)	0.000

(a) Wilcoxon Signed Ranks Test, (b) Based on negative ranks.

Based on the Wilcoxon test output in Table 4, the Asymp.Sig values were obtained. (2-tailed) of 0.000 smaller error level of 0.05, so it was concluded that the use of teaching materials in microeconomic theory affect the improvement of student learning outcomes.

Progressive assessment of the evaluation stage is very useful for determining the quality of the design. Determination of the quality of the design before and after its implementation helps avoid waste of resources, resulting in a good quality customer design [11].

Based on the findings and support of existing research results, it is confirmed that teaching materials developed using the ADDIE model can be used in learning microeconomic theory in the University of Jambi's economic education study program. Teaching material for microeconomic theory is designed based on learning needs that are based on student characteristics and subjects. Teaching material developed is assessed by material experts and design experts as feasible to be applied in the learning process. In its implementation, it received positive responses from students and was proven to be able to improve learning outcomes in both small and large classes.

4 CONCLUSION

Based on research development using the ADDIE model shows that teaching materials that have been developed are appropriate to be used in learning microeconomic theory at the University of Jambi Economic Education Study Program. The feasibility is based on the results of the assessment of material experts showing a suitability level of 90 percent and a teaching material design expert of 90.48 percent. Student response. both in small classes and large classes assess teaching materials developed very support learning microeconomic theory with an average score of 3.5 and 3.5. The level of feasibility is also evidenced by the results of the analysis of the effectiveness of its use in learning which is significant in improving learning outcomes at the error level of 5 percent.

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