Improvement of Teaching Materials of Microeconomic Theory (Case Study of Economic Education Study Program in State University of Medan)

Putri Sari MJ Silaban[1], Joko Suharianto[2], Aurora Elise Putriku[3], Sabda Dian Nurani Siahaan[4]

[1,2,3,4]*Faculty of Economics, State University of Medan, Indonesia*
ellonagultom01@gmail.com

Abstract

This study aims to produce microeconomic theory teaching materials. This study uses a research and development (R&D) method based on the Bord and Gall concept. The population of this study was all students of microeconomic theory subjects in the economic education study program in 2020. The sample was determined by purposive random sampling and the sample class was used for application and limited testing of a small sample, namely class C of Economic Education. Based on the results of the study, the microeconomic theory teaching materials made and validated by 3 expert validators resulted in a decision that teaching materials had a very high level of feasibility (81.25%) with a note that revisions needed to be made. After all revision notes have been corrected, a small group trial was conducted on 20 class C students of economic education in the microeconomic theory course. Based on the results of small group trials, it is known that there has been a significant increase in learning outcomes before and after using Microeconomic Theory teaching materials. The result is that all factors of convenience for users, usability, and time effectiveness have a percentage value of 81.85%, meaning that it is concluded that the book developed has met the criteria for readability and practicality. This research was conducted only up to the 7th stage, namely producing a revised draft of the teaching material product. The result is that all factors of convenience for users, usability, and time effectiveness have a percentage value of 81.85%, meaning that it is concluded that the book developed has met the criteria for readability and practicality. This research was conducted only up to the 7th stage, namely producing a revised draft of the teaching material product. The result is that all factors of convenience for users, usability, and time effectiveness have a percentage value of 81.85%, meaning that it is concluded that the book developed has met the criteria for readability and practicality. This research was conducted only up to the 7th stage, namely producing a revised draft of the teaching material product.

I. Introduction

Various methods are used to improve student competence, including innovation in learning methods and revitalization of teaching materials that are relevant to current developments and technology. Referring to the era of the Industrial Revolution 4.0 which is currently developing, it is deemed necessary to have a new orientation in the world of education, especially in the concept of teaching materials used by students. The term

Industry 4.0 itself was officially born in Germany to be precise when the Hannover Fair was held in 2011 (Kagermann et al, 2011). Zhou et al (2015) explained that in general five big challenges will be faced, namely the aspects of knowledge, technology, economy, social, and politics. To answer these challenges, a large, well-planned, and strategic effort is needed both from the regulatory (government) side, academics and practitioners.

The problem is that previously the lecturer team had compiled a book on microeconomic theory, but it had not gone through a series of relevant research and development. Besides, the books used in microeconomic theory courses do not match the material with the RPS used. Therefore, in the lecture process of this microeconomic theory course, it is deemed necessary to compile a teaching material that is relevant to the material being taught and the presentation of the book in a more interesting way using Powtoon animation. Besides, the teaching materials developed are adapted to the concept of 6 KKNI tasks, namely in the form of routine assignments, journal reviews, critical book reports (CBR), mini-research, projects, and idea engineering adopted by Medan State University.

Based on this background, research was carried out on the development of textbooks as an effort to improve student learning outcomes of microeconomic theory. The main objective to be achieved in this research is the production of a microeconomic theory textbook.

II. Research Methods

This research uses research and development methods. The purpose of development research according to Borg & Gall (1983) is to develop and validate research products.The steps in research and development are carried out in 10 steps with the following stages: 1) potential and problems, 2) data collection, 3) product design, 4) design validation, 5) design revision, 6) product testing, 7) first product revision, 8) use trial, 9) second product revision and 10) mass production (Sugiyono, 2010). Due to time constraints, the research and development (R&D) step of preparing Microeconomic Theory teaching materials only reached the 7th stage, namely product revision II.

This research was conducted for 6 months in the Economic Education Study Program, FE Unimed. Research subjects as a source of data in this study were lecturers and students of economic education in semester III students in the microeconomic theory course in the academic year 2020/2021. Lecturers who are the subject of this research are lecturers who teach microeconomic theory courses at FE Unimed and lecturers who are in KDBK economic education learning program. The development of microeconomic theory teaching materials is of good quality if it meets aspects of validity, practicality, and effectiveness.

2.1 Data Analysis
The development of microeconomic theory teaching materials is of good quality if it meets the following aspects of validity, practicality, and effectiveness:
a. Validity / Eligibility
The data analysis technique used in this research is quantitative data analysis techniques. The assessment data obtained from the validator were analyzed descriptively qualitatively and used as a reference for revising the product to produce a viable product. The product design developed is assessed by the validator using a validation sheet. The results of the assessment of all aspects are measured by a Likert scale. A Likert scale is some positive or negative statements about an object of attitude. The main principle of the Likert scale is to determine the location of a person's position in a continuum of attitudes

towards attitude objects ranging from very negative to very positive (Wagiran, 2013).

In this study the answers to the instrument items were classified into five options. Each measured indicator is given a scale score of 1-5, namely:

Table 1. Eligibility Indicators

Scale	Information
5	very good / very appropriate / very feasible / very clear
4	good / appropriate / appropriate / clear
3	not good / not suitable / not appropriate / not clear
2	not good / inappropriate / inappropriate / unclear
1	Not very good / very inappropriate / very inappropriate / very unclear

The next step is to assess the feasibility of microeconomic theory teaching materials. After the data is obtained, then to see the weight of each validator's response by calculating the average score with the following formula (Ernawati and Sukardiyono, 2017):

$$\text{Average total score} = \frac{Skor\ Total}{Jumlah\ Penilai}$$

Then the percentage formula for the results can be calculated by the following formula.

$$\text{Result} = \frac{Rata-rata\ Skor\ Total}{Nilai\ Maksimal} \times 100\%$$

Eligibility categories are based on the following criteria:

Table 2. Eligibility Criteria for Products / Teaching Materials / Media

No.	Score in%	Eligibility Category
1	<21%	Very Unworthy
2	21 - 40%	Not feasible
3	41 - 60%	Decent enough
4	61 - 80%	Well worth it
5	81 - 100%	Very Worth it

Source: Arikunto, (2009)

b. Practicality

To test practicality, students will later assess the readability of the media on a limited sample of textbooks that have been made using the Likert scale. This practicality test examines the readability of textbooks in terms of ease for users (Learnability), efficiency (Efficiency), and effectiveness of time (Effectiveness of Time). Later, the total value range of the resulting Likert scale will be converted to the value criteria determined by the practicality of using the textbook.

Analysis of the practicality of the product in the questionnaire can be calculated using the following formula (Akbar, 2011):

$$\textbf{Vp} = \frac{TSEp}{S-max} \times \textbf{100\%}$$

Information :

    Vp   = Validity of Practicality
    TSEp   = Total Score Empirical Practicality
    S-max = Score maximum expected

After knowing the practicality value, to describe the practicality results it can be seen from the following criteria:

Table 3. Criteria for Practicality of Interactive Multimedia

Information	Category	Information
75.01% - 100%	Very Practical	Can be used without revision
50.01% - 75.00%	Practical	Can be used with minor revisions
25.01% - 50.00%	Less Practical	Recommended not to use
00.00% - 25.00%	Impractical	Can not be used

Source: Adapted from Akbar, (2011)

c. Effectiveness

To test the effectiveness of this teaching material, a small, limited group trial will be carried out with a before-after (one to one) experimental design using the paired sample t-test. Testing the effectiveness of teaching materials was carried out on a small sample of 10 students who had already completed microeconomic theory courses. This before-after experimental design tests the effectiveness of textbooks on learning outcomes before and after treatment using textbooks. This test uses a paired sample t-test with the following hypothesis:

Ho: There is no difference in learning outcomes before and after treatment using microeconomic theory textbooks.

Ha: There are differences in learning outcomes before and after treatment using microeconomic theory textbooks.

With the criteria for accepting Ho, if the value of Sig> 0.05 and rejecting Ho if the value of Sig <0.05 (Kadir, 2015).

III. Results and Discussion

The development of teaching materials has been done through a series of research and development which refers to Borg and Gall (1983) with the following steps:

a. **Potentials and problems** namely discussing the availability of potential studies and problems in developing microeconomic theory teaching materials.

At this stage, it discusses the background for the development of microeconomic theory teaching materials that are commonly used by students. The results of the evaluation to students turned out to be several obstacles including the following:

1) From the results of the development of the RPS for the microeconomic theory course, it is known that the teaching material is scattered in several books, making it difficult for students to learn. The hope is that it can be easier and more efficient for learning resources that are more integrated according to the material needed. Therefore, it is necessary to design a book that is more comprehensive and following the RPS material used.

2) Previously, there had been a book on microeconomic theory that had been prepared, but it had not gone through the process of further R&D research so that research and development of this teaching material were necessary.

b. **Data collection** namely the availability of information that can be used for planning the preparation of teaching materials for microeconomic theory teaching materials which in this study are:

1) Standardization document of RPS for microeconomic theory courses

2) Concept document 6 KKNI assignments in microeconomic theory courses

3) Document of learning outcomes assessment instruments for microeconomic theory

c. **Product design** namely the availability of a draft book on microeconomic theory.

At the design stage, textbooks are developed based on competency standards,

basic competencies, and competency achievement indicators in microeconomic theory courses. The book material is arranged in CHAPTER VIII, each of which consists of a description of the subject matter of the lesson, examples of cases according to the subject matter, and is equipped with examples of multiple choice practice questions.
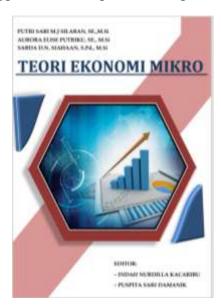

Figure 1. Book Cover Views of Microeconomic Theory

d. **Design Validation** namely the availability of validation test results documents.

Textbooks that have been compiled at the product design stage are then tested through several stages. The first stage is the textbook validation test using expert validity assessments.

The validation is carried out through a questionnaire given to the expert team after revisions. The validation of the questionnaire was carried out by three validators who are experts in the field of microeconomic theory. The experts used to measure feasibility are (1) Dr. Arwansyah, M.Si. (Material Expert, Head of Micro Economics, Postgraduate Economics Study Program); (2) Dr. Dede Ruslan, M.Si. (Material Expert for the Micro and Macro Economics Study Program, Postgraduate Economics) and (3) Dr. Khairuddin E. Tambunan, M.Si (Media Expert, Lecturer in Economic Education Study Program).

After the validation sheet is revised, the validator provides an assessment of the module description. Following are the results of expert validation regarding module improvements.

Table 4. Enter the Revised Module from the Validator

No.	Name	Validation
1	Dr. Arwansyah, M.Si.	• Each calculation should be accompanied by examples of questions that are relevant to problems that are easy for students to understand. • Create a more attractive application cover design
2	Dr. Dede Ruslan, M.Si.	• The material in the application must be following the RPS of the course. • Make the image more colorful to make it more interesting.

No.	Name	Validation
3	Dr. Khairuddin E Tambunan, M.Si.	• It is necessary to clarify the details of the 6 KKNI tasks as a whole. • Use language refurbishment that is easier for students to understand.

Source: Primary data, processed (2020)

Some of the aspects observed in textbooks can be seen in Table 3. Based on the results of the considerations of the two experts onThe 16 aspects observed from the 12 chapters received an overall assessment as follows:

Table 5. Aspects of the Validity of Textbook Contents

No.	Observed aspects	Validator		
		1	2	3
1	Textbooks are following the curriculum syllabus	4	4	5
2	Textbooks according to the expected basic competencies	5	4	4
3	Textbooks are relevant to the material students must study	4	4	4
4	The content of the textbook material has a correct and precise concept	4	4	4
5	Textbook material helps explain concepts	4	4	4
6	The textbook contains relevant sample questions	4	5	4
7	The textbook contains task questions based on 6 KKNI tasks	4	4	4
8	Suitability of practice questions with the material being studied	4	5	4
9	The suitability of sample questions and practice questions with the ability to be improved	4	4	4
10	The practice questions in the existing textbook have met the proportion of difficulty levels	4	3	4
11	The language used is good and correct	4	4	4
12	The language used is easy to understand and understand	4	4	4
13	The appearance and arrangement of the book is attractive	4	4	3
14	An interesting arrangement of figures and tables	5	4	4
15	The font size used is clear	4	4	4
16	Students can use textbooks independently	4	4	4
	Total	66	65	64

Source: Primary data, processed (2020)

Based on the results of the three experts' assessment ofThe 16 aspects observed in the microeconomic theory teaching materials are then sought for the total average score:

Average total score $= \frac{195}{3} = 65$

Then the percentage formula for the results can be calculated by the following formula.

Result $= \frac{65}{80} \times 100\% = 81.25\%$

Based on the percentage value of the validation of teaching materials of 81.25%, it can be concluded that overall the three experts have the same considerations regarding the content of textbooks, so it can be concluded that the draft of microeconomic theory teaching materials is valid and feasible to use, but it needs some expert revision advice.

e. **Design Revision** namely the availability of a draft revised design result of design validation by experts.

After going through the expert validation stage, the first revision of the textbook draft is carried out by adjusting the assessment of the experts to produce a revised edition of the microeconomic theory textbook.

f. **Product Trial**namely the document of limited trial results in a small class sample, namely that one semester III class is selected as a sample class that is currently in the microeconomic theory course. Before-after experimental design on the material sample of consumer behavior theory in 2 meetings, the first meeting students were given pre-test questions and used an online learning system using a draft microeconomic theory textbook, at the final meeting they were given post-test questions. Finally, from the meeting students will be given a questionnaire to assess the readability of the teaching material.

The results of this small group trial used a paired sample t-test with the following results:

Table 6. Results of the Pairwise Difference Test Calculation

Paired Samples Test

					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Mean Error	Lower	Upper	T	Df	Sig. (2-tailed)
Pair 1	Before-after	-23.15	9.92	2.21	-27.79	-18.50	-10.43	19	.000

Source: Primary data, processed (2020)

Based on the table above, the t value is 10.434 with the Sig. 000 <0.05, then Ho is rejected. This means that student learning outcomes after using microeconomic theory textbooks are significantly higher than student achievement results. This shows that the textbooks produced are proven to improve student learning outcomes.

Furthermore, the results of the readability test assessment on a limited sample consisting of20 students can be seen in the following table:

Table 7. Assessment of Book Readability on Limited Samples

No.	Indicator	Score
A	**Variable: Ease for User (Learnability)**	
1	Instructions for use of teaching materials	80
2	Use of language & sentence structure according to the level of student ability	80
3	Can support individual and group learning processes	84
4	Exercises can help students understand concepts	82
5	The books used can facilitate the learning process	80
B	**Variable: Efficiency**	
1	Teaching materials can help students deepen their understanding of the material	82
2	Pictures in teaching materials can help students find concepts	80
3	Teaching materials are easy to understand	84
4	Assignments on teaching materials can assist students in understanding concepts	82

No.	Indicator	Score
5	Teaching materials are more practical and can be adjusted according to students' abilities without distinguishing SARA	84
6	The attractiveness of the display of teaching materials can motivate students to learn	82
C	**Variable: Effectiveness of time**	
1	The use of teaching materials can streamline learning time	80
2	*Blended learning* used can streamline learning time	80
3	The learning evaluation concept used is very effective for students	86
	Total	1,146

Source: Primary data, processed (2020)

Based on the total score of 20 students who took the practicality test, the total score was 1,146 with a maximum total score of 1,400. The analysis of the level of practicality of the product of microeconomic theory teaching materials can be calculated with the following formula:

$$Vp = \frac{1146}{1400} \times 100\% = 81.85\%$$

The percentage of the practicality test is 81.85%, referring to Table 3 above, it can be concluded that the microeconomic theory textbooks are compiled into very practical categories. This means that the contents of the book can be understood well by users (students), meet the criteria of readability and practicality, but still need to be revised based on user input (students).

g. **Product revision** namely the availability of a revised draft of teaching materials as a result of limited test input.

After going through the product trial stage on a small sample and also a readability test for students, then revisions are made according to student input to produce a product revised microeconomic theory textbook that is ready to be tested on large group samples.

V. Conclusion

Based on the results of the research, it can be concluded that the research and development of this teaching material have produced microeconomic theory teaching materials that have been validated by 3 expert validators resulting in a decision that the teaching material has a very high level of feasibility (81.25%) with a note that it needs to be revised. After all validator revision notes were corrected, a small group trial was carried out on 20 class C students of economic education in the Microeconomic Theory course. Based on the results of small group trials, it is known that there has been a significant increase before and after using Microeconomic Theory teaching materials. The test results of readability and practicality of the teaching materials used show that all the factors of convenience for the user, effectiveness, and time effectiveness have a practicality percentage value of 81.85% meaning that it is concluded that the book being developed has met the criteria of readability and practicality according to the user. This research was conducted only up to the 7th stage, namely producing a revised draft of the teaching material product.

The suggestion in this research is that there is a need for continuity and improvement of research and development steps in the teaching materials of this book to improve the teaching materials for microeconomic theory. The next step is a large sample trial, which

in this case is to test 2 classes of students for 1 semester with an experimental research design and a control class. At the end of the meeting, a learning outcome test and a questionnaire for assessment will be given and an open questionnaire about the microeconomic theory teaching materials to be revised to produce a revision of the final book before it is proposed to be produced more.

References

Akbar, Sa'dun. 2011. Curriculum Development and Social Science Learning. Yogyakarta: Cipta Media.

Arikunto, S & Safruddin AJ, C. 2009. Evaluation of Educational Programs. Jakarta: Earth Literacy.

Borg, Walter., & Gall, MD (1983). Educational Research: An Introduction (4ed). New York & London: Longman.

Ernawati, I and Sukardiyono, T. (2017). Feasibility Test of Interactive Learning Media on Server Administration Subject. Elinvo Journal (Electronics, Informatics, and Vocational Education), Vol. 2 (2)

Kadir. 2015. Applied Statistics: Concepts, Examples, and Data Analysis with the SPSS / Lisrel Program in Research. Jakarta: PT Rajagrafindo Persada

Kagermann, H., Luke, WD, & Wahlster, W. (2011). Industrie 4.0: Mit dem Internet der Dinge auf dem Weg zur 4. Industriellen Revolution. http://www.vdinachrichten.com/Technik-Gesellschaft/Industrie-40-Mit-Internet-Dinge-Weg-4-industriellen-Revolution.

Kagermann, H., Luke, WD, & Wahlster, W. (2013). Final report: Recommendations for implementing the strategic initiative INDUSTRIE 4.0. Industrie 4.0 Working Group.

Sugiyono, (2010). Quantitative Research Methods, Qualitative and R & D. Bandung: Alfabeta.

Wagiran. 2013.Implementation of the 2013 Curriculum in Learning and. Assessment. Semarang: CV Bahtera Wijaya Perkasa.

Zhou, K., Taigang L., & Lifeng, Z. (2015). Industry 4.0: Towards future industrial opportunities and challenges. In Fuzzy Systems and Knowledge Discovery (FSKD), IEEE 12th International Conference, pp. 2147-2152.