

# Development of E-Module using Heyzine Flipbook Maker Through The Problem-Based Learning Model In the Educational Economics Course At Economics Education Study Program Universitas Negeri Medan

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**Abstract.** The problem in this study is that the teaching module used by students is not based on problem solving, its appearance is not attractive, and is often avoided by students because it is considered to have too much weight. In addition, the module has not been able to encourage high-level thinking skills in students. The study was conducted to create an e-module with the help of Heyzine Flipbook Maker through the application of a valid and practical problem-based learning model, especially for the Economics Education course. This research is a development research (Research and Development) with ADDIE stages, namely analysis, design, development, implementation, and evaluation. The research steps include: (a) analysis of the needs of the product being developed; (b) development of an e-module using Heyzine Flipbook Maker with a problem-based learning approach; and (c) implementation and evaluation of the developed e-module. The subjects of this study were third semester students from the Economics Education study program. The data analysis techniques used included the validity and practicality of the module. This module was validated by material experts and design experts. The results of the study stated that based on the feasibility test, this module was categorized as very feasible, while based on the practicality test involving lecturers and students, this module was categorized as very practical.

**Keywords:** E-Module, Problem-Based Learning Model

## 1. Introduction

Formal education in schools aims to regulate planned changes in students, both in terms of knowledge, skills, or attitudes. During the learning process, this is influenced by materials or teaching materials that come from several sources and learning aids. Through learning media, students are encouraged to understand the material given. This opinion is supported by the view [2], which states that the use of learning media can encourage the quality of student learning outcomes because teachers are active in delivering material, and student involvement in learning, makes it easier for them to master the material presented. In their daily duties, educators are often faced with the fact that students' academic achievements are not always as desired. The use of learning media is one of the supporting aspects.

The development of science and technology, as well as the development of new theories in learning psychology, encourages the need for a paradigm shift in teaching. Teaching is no longer only considered as a process of transferring knowledge and skills that is entirely carried out by educators, but as a collaboration between educators and students to use every available learning tool and resource. With the goal that students can learn independently in order to achieve learning outcomes. Therefore, educators are expected to be able to provide and develop various media and learning resources that support independent learning for students.

The learning process is basically a form of communication, where communication must be established through the exchange of information between lecturers and students. In order for learning to run effectively, quality teaching materials are needed. Currently, the phenomenon that occurs in the subject of economics education is the use of teaching materials such as printed books or modules. However, these printed teaching materials have several weaknesses, such as their appearance is less attractive and are rarely carried by students because of their heavy size. In addition, printed books also do not encourage students to develop high-level thinking skills.

Lecturers can actually create innovative teaching materials by utilizing interesting and easily accessible information technology, allowing students to carry them and read them anytime and anywhere. Moreover, in today's era, students tend to always carry devices such as smartphones. Lecturers need to see this opportunity as a means to improve the quality of learning. In addition to innovative teaching materials that utilize information technology, teaching materials are also needed that can foster the active role of students so that learning outcomes can be achieved. Therefore, it is necessary to develop a module that can be used as a reference for independent learning for students and can hone students' high-level thinking skills.

Departing from these problems, the use of e-modules through problem-based learning is an alternative in solving these problems. By using this learning module, it is hoped that there will be an increase in student competence in understanding the material and learning independently without the help of a facilitator. The preparation of e-modules begins with preparing materials according to needs. The module is arranged based on problems as interesting as possible, and is interactive so that students learn independently. Therefore, the researcher studied the "Development of E-Modules Using Heyzine Flipbook Maker Through the Problem Based Learning Model in the Economics Education Course, Economics Education Study Program, State University of Medan".

## **2. Theoretical Review**

### **Electronic Modules**

According to [4], modules are often used as learning resources by educators as aids in the teaching process. This module contains learning guides concerning materials, methods, and exercises and evaluations. Module development is carried out systematically, useful for ensuring students obtain the expected competencies. In line with the view of [5], a module is a teaching material made in a language that is not difficult to understand, adjusted to the level of knowledge and age of students, so that they can learn independently. Thus, a module is defined as a

collection of teaching materials that are designed in a structured manner, including materials, methods, and learning exercises and evaluations, allowing students to learn independently without the need for active involvement from teachers.

Along with technological advances, the use of computers and the internet, as supporting facilities for learning activities, is interactive and is expected to facilitate interactive communication between lecturers, students, and teaching materials. E-modules as digital learning media are expected to play a complementary role in the development of learning resources. Several main factors in the development of digital-based teaching materials include content, validity, and functionality [6]. In line with that, according to [7], e-modules are non-printed digital-based teaching materials that are designed to be studied independently by students. The creation of e-modules can be done through applications such as Heyzine Flipbook Makers. Now, the development of science and technology has an impact on learning activities.

Hayzine Flipbooks is a free application that is very easy to use in creating e-books. This multimedia application is able to accommodate files such as PDF, images, videos, and animations, making the resulting flipbook more interactive and dynamic. As an online-based platform, Hayzine Flipbooks does not require downloading to the device, but is designed to convert PDF files into digital publications with a printed book-like appearance. This application presents more attractive and immersive visuals. With its ability to insert text, images, videos, and audio, Hayzine Flipbooks enriches learning media, making it more varied and interesting, thus encouraging students to learn independently.

### **Problem Based Learning Model**

E-modules are able to increase students' interest in learning, so it is highly recommended for educators to integrate e-modules into learning. In developing e-modules, choosing the right learning method is very important, as explained by [8], the method is a crucial component in a learning system. The success of implementing a learning model depends on how teachers apply it in the classroom. One suitable model in developing e-modules is problem-based learning.

The Problem-Based Learning learning model is a method that focuses on solving problems that place students as the center of the learning process, thus encouraging more active and participatory learning (student-centered learning) [9]. One of the student-centered learning approaches that is effective in encouraging critical thinking skills is by implementing PBL. Based on various expert opinions, the conclusion is that PBL is a learning model designed from the context of problems to encourage students to learn independently and improve critical thinking skills in solving problems, by demanding their activeness throughout the learning process.

Characteristics of problem-based learning are [10] :

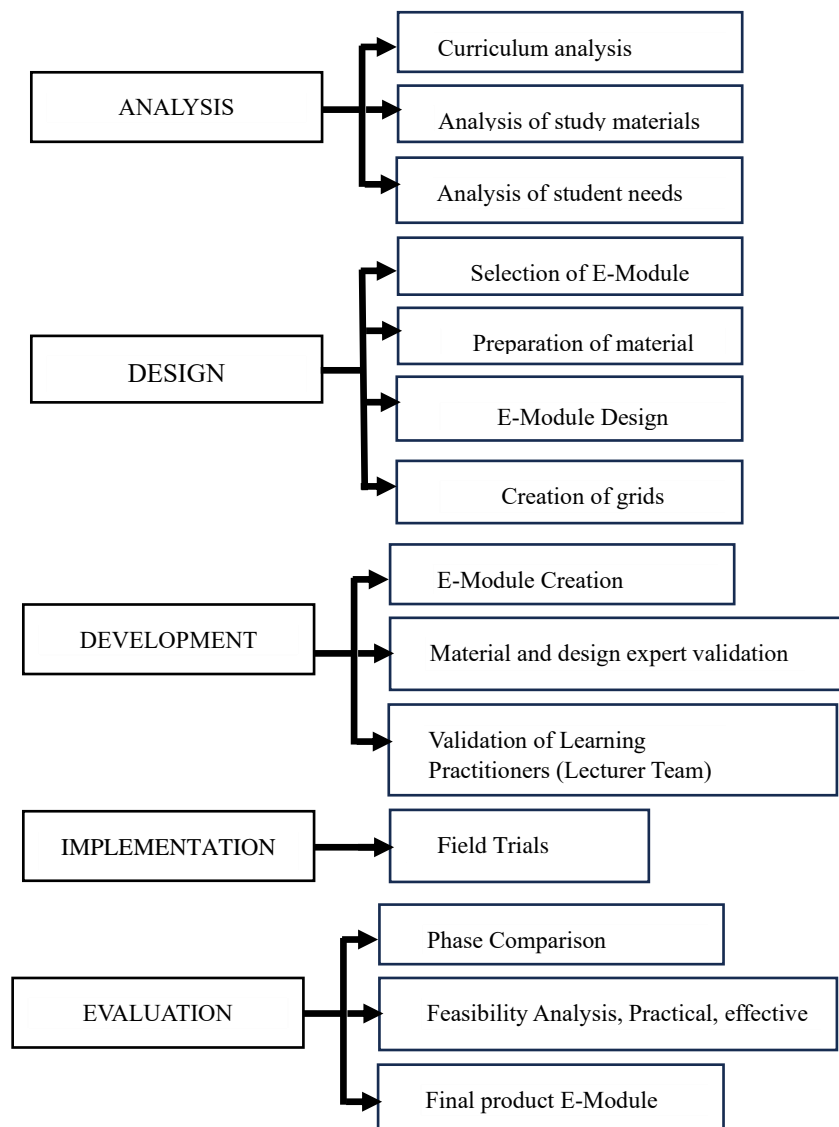
- a. First, learning begins by presenting problems that are in accordance with real life experiences experienced by students or their surrounding environment.

- b. The problems selected are related to learning outcomes;
- c. Students independently solve problems through authentic investigations.
- d. Then, in small groups, they work together to find solutions to solve existing problems.
- e. The teacher acts as a guide and facilitator.
- f. Students are responsible for gathering knowledge and information from various sources, not limited to just one reference.
- g. Students present the results of problem solving in the form of a specific product.

With problem-based learning, students who are trying to solve problems will apply the knowledge they have or seek new relevant knowledge. This makes learning more meaningful and expansive when students are faced with situations of applying concepts. [11] .

### **3. Method**

The author chose a research and development method known as Research and Development (R&D). This method is used in validating and developing products. According to [12], product development has a broad meaning including improving existing products (to be more effective, efficient, and practical) as well as creating new products. In this study, the researcher applied the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) development model, because the development of e-modules as learning media is the main focus. Therefore, the ADDIE model is considered appropriate for the development of this learning media product. The researcher used the ADDIE model to produce a product in the form of an e-module in the economics education course to provide an approach between lecturers and students in the learning process. The development steps can be described in the following figure:



**Figure 1.** Development Steps

This research was conducted at the Economic Education Study Program, Faculty of Economics, State University of Medan. The subjects of the study consisted of students of the economic education study program who used e-modules developed through Heyzine flipbook maker with a problem-based learning approach. The selection of locations and classes was based on student criteria based on research needs, namely classes that had never used e-modules with a problem-based learning model before.

The data collection technique in this study applied questionnaires and questionnaires to evaluate the results of research development. The instrument used was adapted from [7] and was designed to collect data from material experts and learning design. The Likert scale was used as an alternative answer, with four response options: strongly agree (4), agree (3), disagree (2), and strongly disagree (1).

The data analysis techniques in this study are as follows:

1. Data Validity Analysis

In analyzing module validation, a Likert scale is used according to the validation sheet with the following stages:

- a. Give a score to each answer item
- b. Calculate the total score of each validator on all indicators.
- c. provide validator values.

Analysis of data validity using the formula; [13]

$$V = \frac{\sum x}{\sum xi} \times 100\% \quad (1)$$

Information;

V = Percentage of module validity

$\sum x$  = Total expert assessment

$\sum xi$  = Total ideal value

The validity category criteria of the module are in Table 1.

**Table 1.** Module Validity Categories

No	Validity	Validity level
1	$85\% < V \leq 100\%$	Very valid
2	$70\% < V \leq 85\%$	Valid
3	$50\% < V \leq 70\%$	Less valid
4	$V \leq 50\%$	Invalid

A module is declared valid if it reaches a validity level above 80%.

## 2. Practical Data Analysis

The practicality level of the module is based on a questionnaire to lecturers (colleagues) and students. The questionnaire was made with a Likert scale with a positive category. Positive statements are given high weight with the following details:

- a. very good ( VG ) weighing 5
- b. good ( G ) with a weight of 4
- c. sufficient ( S ) with a weight of 3
- d. less ( L ) with a weight of 2
- e. bad ( B ) with a weight of 1

By calculation; [13]

$$P = \frac{\sum TSe}{\sum TSh} \times 100\% \quad (2)$$

Information:

P = Percentage of module practicality

TSe = Total score of all student respondents

TSh = maximum possible score of all respondents

The level of achievement of the practicality category of the module uses the classification in Table 2.

**Table 2.** Module Practicality Level

No	Degree of Achievement (%)	Category
1	$80\% < P \leq 100\%$	Very practical
2	$60\% < P \leq 80\%$	Practical
3	$40\% < P \leq 60\%$	Less practical
4	$20\% < P \leq 40\%$	Not practical
5	$0\% < P \leq 20\%$	Very impractical

A module is said to be practical if it has achieved a practicality level above 80%.

## 4. Results and Discussions

### Results

The development of e-modules was carried out using Heyzine flipbook maker through a problem-based learning approach, which was developed by following the ADDIE model.

#### 1. Analysis Stage

This stage is the initial stage. This stage includes curriculum analysis, educators (lecturers), and students.

##### a. Curriculum Analysis

Curriculum analysis, namely analyzing the curriculum used at Medan State University, namely the OBE (Outcome-Based Education Curriculum). At the curriculum analysis stage, researchers analyzed graduate learning outcomes (CPL) in the Economics Education Study Program. The profile of graduates of the Economics Education study program is determined through a mechanism that integrates academic vision with SWOT analysis (strengths, weaknesses, opportunities, and threats) and market needs analysis. This is done through a tracer study of alumni, coupled with input from professional associations, stakeholders, and the community.

Graduate Learning Outcomes are written based on the KKNI and SN-Dikti qualification levels. CPL includes elements of attitude, skills, and knowledge. The attitude and skill elements refer to SN-Dikti as a minimum benchmark, which can be added by study programs to create unique characteristics for college graduates. Meanwhile, the specific skills and knowledge elements are formulated based on the KKNI descriptors according to the relevant level of education. The formulation of Graduate Learning Outcomes (CPL) is recommended to include skills relevant to the 4.0 era, including the following abilities: a) data literacy, which is mastery in understanding, analyzing, reading, and using data and information (big data) in a digital context; b) technological literacy, which includes an understanding of machine performance and technology applications such as coding, artificial intelligence, and engineering principles; c) human literacy, which involves an understanding of the humanities, communication, and design; d) 21st century skills that support the development of HOTS (higher order thinking skills), including communication, collaboration, critical thinking, creative thinking, computational logic,

compassion, and civic responsibility; e) understanding of the industrial era 4.0 and its developments; f) knowledge that can be applied for the common good at the local, national, and global levels; g) learning achievements and other abilities that can be obtained outside the study program through MBKM activities.

b. Analysis of the Needs for Educators (Lecturers)

At this analysis stage, the researcher conducted a discussion with colleagues (course team) and the researcher found that the use of teaching materials in learning activities in the economics education course was not optimal, because the teaching materials that were often used were printed books or modules and so far the students' teaching materials were not problem-based, so they had not been able to hone students' critical thinking skills. Therefore, the researcher realized that there was a need to improve students' competence in understanding the material and learning independently without the help of a facilitator. So the researcher wanted to develop an e-module through problem-based learning using the Heyzine flipbook maker.

c. Student Needs Analysis

Student needs analysis is carried out to determine the teaching materials needed by students according to the curriculum used. So far, teaching materials have an unattractive appearance and are rarely carried by students because they have a large burden. Therefore, researchers prepare problem-based e-modules using the Heyzine flipbook maker and design them as attractive as possible, interactive so that students can learn independently.

**2. Design Phase**

The design stage is the stage of making the module to be developed. The problem-based electronic module (E-Module) in this study was compiled using the Heyzine Flipbook Maker application. The steps worked on by the researcher are:

a. Designing new product development tools.

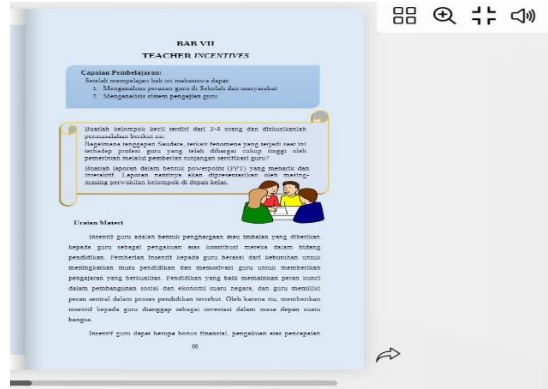
The design of new product development tools is carried out by compiling the E-Module framework sequentially as presented in the table:

**Table 3.** E-Module Framework

E-Module Framework	Appearance
Cover	



## Problem Based Learning



### b. Organizing the material

In this stage, the researcher selects and collects relevant materials in the problem-solving-based e-module. A total of 11 materials will be discussed in the e-module, namely (1) Basic concepts of educational economics, (2) Concept of human resources in economic doctrine, (3) Human capital and Signaling Theories of education, (4) Determinants of educational success in the field of education, (5) Educational service market, (6) Calculation of educational elasticity, (7) Teacher incentives, (8) Education financing, (9) Measurement of educational unit performance, (10) Education implementation budget, (11) Financial management of educational institutions.

### c. Create a product assessment questionnaire grid.

The creation of the E-Module product assessment questionnaire grid was compiled by looking at the Likert scale questionnaire. The Likert scale questionnaire used includes 4 options: Very Good, Good, Less, and Very Less. This study was used to assess the validity or feasibility of the E-Module developed from the design of the material and module. Meanwhile, the material expert validation questionnaire has been validated by Dr. Khairuddin E. Tambunan, M.Sc. The learning design expert validation questionnaire was validated by Mr. Adek Cerah Kurnia Azis, S.Pd., M.Pd. In the material expert questionnaire, there are 4 assessment aspects to see the suitability of the E-Module material, namely content, construct, and language. In the learning design expert questionnaire, there is an appearance assessment aspect to see the feasibility of the E-Module design.

### d. Development Stage

The development stage is the design by developing the media design that has been made previously. This stage consists of feasibility analysis and practicality analysis.

#### 1. Validation Analysis by Material Expert

Validation of material experts is an assessment by a validator of material experts on the subject of educational economics in the developed E-Module. In this study, the validator of material experts is Dr. Khairuddin E. Tambunan, M.Si as a lecturer at the Faculty of Economics, State University of Medan. The results of the validation of educational economics material are presented in the following table:

**Table 4.** E-Module Feasibility Assessment Validated by Material Experts

<b>Assessment Aspects</b>	<b>Expert Score</b>	<b>Category</b>
Presentation	88.89%	Very Feasible
Material	87.5%	Very Feasible
Language	87.5%	Very Feasible
Total Score	87.96%	Very Feasible

According to the assessment table above, from the three assessment aspects, namely presentation, material, and language, it can be concluded that the validation results by the material expert validator received a percentage value of 87.96% in the "Very Eligible" category, which means that the E-Module can be used but there are several parts of the E-Module that require revision. There are several suggestions given by the validator, namely:

- a. In the part of the questions given to students in video form, it is better to shorten the video so that they can focus more on the questions.
- b. At the beginning of the material, it is best to include illustrations or images related to the material to be discussed.

2. Validation Analysis by Design Expert

Expert design validation is an assessment carried out by a validator of learning design experts on the E-Modules created. In this study, the person who acted as a validator of learning design experts was Mr. Adek Cerah Kurnia Azis, S.Pd., M.Pd, a lecturer at the Faculty of Languages and Arts, State University of Medan. The results of the validation of learning design are presented in the following table:

**Table 5.** E-Module Feasibility Assessment by Learning Design Experts

<b>Assessment Aspects</b>	<b>Expert Score</b>	<b>Category</b>
Visual Display		
Use of Letters		
Physical Criteria	95.83%	Very Feasible
Voice		
User Ease		

According to the assessment table, it is concluded that the validation results by the expert validator of learning design obtained a percentage score of 95.83% (Very Eligible) which means that the E-Module learning design can be used without revision. The expert validator of learning design also provided input, namely that the UNIMED Logo was only made into PNG, so that the cover design is more attractive. Then pay attention to the layout of the columns in the

content, so as not to interfere with the appearance of the text, choose a soft color if there is text above the column.

### 3. Implementation Stage (Implementation)

The implementation stage is the application stage carried out if the E-Module has been declared feasible by the expert validator of the material and learning design. This stage is useful for determining the practicality of the E-Module product that has been developed. When the implementation is carried out, the designed and valid module will be given to educators (teacher team), then a response questionnaire will be given. The purpose of giving this response questionnaire is to see how educators respond to the e-module using the Heyzine flipbook maker through the problem-based learning model that has been developed. There are 4 aspects assessed at this stage, namely material organization, evaluation and training, e-module teaching material products, and effects on users. The results of educator responses to the e-module are presented in the table:

**Table 6.** Results of Educator Response Data Analysis on the Practicality Questionnaire

Assessment Aspects	Expert Score	Category
Organizing Materials	94%	Very Practical
Evaluation and practice		
E-module teaching material products		
Effects for users		

Based on the table, it can be seen that the lecturer's response to the e-module using the Heyzine flipbook maker through the problem-based learning model obtained a score of 94% in the very practical category.

### 4. Evaluation Stage (Evaluation)

The evaluation stage is the final stage in the ADDIE model, which is the stage for measuring the success of the E-Module product development objectives, namely by looking at the feasibility analysis and practical results.

#### 1. Evaluation at the Feasibility Analysis stage

The assessment was carried out by expert material validators and learning design experts. The summary data of the validation results of the e-module assessment of the economics education course are presented in the following table:

**Table 7.** Recapitulation of Validation Results

No.	Validator	Eligibility Percentage	Category
1.	Materials Expert	87.96%	Very Feasible

2.	Learning Design Expert	95.83%	Very Feasible
	Average	91.89%	Very Feasible

According to the table, the average percentage result is 91.89% so that the e-module using the Heyzine flipbook maker through a problem-based learning model is included in the "Very Eligible" category.

## 2. Evaluation at the Practical Analysis stage

The practicality assessment was carried out by educators (team lecturers) through a response questionnaire. The average percentage result was 94% so that it was categorized as an e-module using the Heyzine flipbook maker through a problem-based learning model "Very Practical".

## Discussion

The discussion explains the feasibility of the e-module from the results of validation data by material experts and design experts, as well as the practicality of the e-module from the results of educator response data (teacher team). The validation results state that the e-module implementing Heyzine flipbook maker through a problem-based learning model is feasible to use/implement. A good module must have a systematic presentation. The module is designed in a structured manner so that its objectives are clear and can be achieved by students [14]. The material aspect obtained a score of 87.5% in the very appropriate category, this shows that the preparation of the material is in accordance with user needs. Material that has been specifically designed according to learning objectives can make it easier for students to learn and achieve learning completeness [15].

The results of peer responses (teacher team) regarding the practicality of the e-module using Heyzine flipbook maker through a problem-based learning model were assessed from the aspects of material organization, evaluation and training, e-module teaching material products, and effects on users, obtaining a score of 94% included in the "very practical" category. This means that the e-module uses Heyzine flipbook maker through a problem-based learning model that is developed very practically, in other words, it can be used by students and educators. This e-module makes it easier for students to grow their enthusiasm, increase their interest in learning, and students can more easily understand teaching materials through images, readings, and questions in the e-module. Through this e-module, students are also able to encourage critical thinking skills in learning. That one of the characteristics of a module that can be interesting and good is that it is self-instructional, which means that through the e-module, students can learn by themselves without relying on educators [16].

## 5. Conclusion

1. E-Module is a teaching material used through the Heyzine Flipbook Maker application

where the e-module is aimed at economic education students in the economic education course. The e-module developed contains 11 materials to be discussed, namely (1) Basic concepts of educational economics, (2) The concept of human resources in economic doctrine, (3) Human capital and Signaling Theories of education, (4) Determinants of educational success in the world of education, (5) Educational service market, (6) Calculating educational elasticity, (7) Teacher incentives, (8) Educational financing, (9) Measuring the performance of educational units, (10) Educational budget, (11) Financial management of educational institutions. The e-module will discuss several problems faced by students.

2. The results of the validation of the feasibility of the e-module using the Heyzine flipbook maker through the problem-based learning model are categorized as "Very Feasible" for use in teaching and learning activities that have been validated by expert material validators and learning design experts.
3. The results of the practical e-module on the use of the Heyzine flipbook maker through a problem-based learning model can be categorized as "Very Practical" for use in the learning process based on the responses of colleagues (team lecturers).

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