

Development of an Inquiry-Based Flipped Learning Model to Train Students' Critical, Creative and Innovative Thinking in Business Feasibility Study Course

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Abstract. This study is a development research that aims to determine the steps of developing an inquiry-based flipped learning model, developing an inquiry-based flipped learning model design that meets the valid, practical and effective requirements. The development model used is the ADDIE development model with stages (1) Analysis, (2) Design, (3) Development, (4) Implementation, (5) Evaluation. The research subjects were Semester VI students of the Business Feasibility Study course of the Economics Education Study Programme. The instruments used in this study were instrument validation sheets, model implementation observation sheets, learning management observation sheets and student response questionnaires. The results showed the validity of the learning model components consisting of syntax, social systems and reaction principles, support systems and accompanying impacts were in the very valid category with an average validity value of 3.38 (syntax); 3.73 (social systems and reaction principles); 3.70 (support systems) and 3.84 (accompanying impacts). This learning model is very suitable to train independence and a sense of responsibility as well as critical, creative and innovative thinking skills for students.

Keywords: Inquiry-Based, Creative, Innovative, Feasibility Study Course

1 Introduction

Schooling is one type of work to work on the nature of HR. Instruction exemplifies a deep rooted growing experience that contacts all parts of life, all degrees of society, and all ages. Consciousness of the significance of training has energized different endeavors and consideration from all degrees of society to each improvement in the realm of schooling, particularly advancements in the area of innovation and data, where information on business plausibility concentrates on that are firmly connected with science and innovation is exceptionally important to be created beginning from the essential level to have the option to contend and have the option to make due with the states of the times that are continuously

developing over the long run, then in the educational experience should have the option to foster the capacity of understudies all in all to have great quality HR to answer difficulties by executing information and abilities.

In the Addendum to the Pastor of Exploration, Innovation and Advanced education Guideline No. 13 of 2015 concerning the Masterful Arrangement of the Service of Exploration, Innovation and Advanced education for 2015-2019, it is expressed that to have the option to satisfy the assumptions for the local area so colleges can likewise assume a part as specialists of monetary turn of events, colleges are expected to deliver developments that can give financial advantages to the local area at large. In accordance with the Vision of LPPM UNIMED to turn into a Global Standard Turn of events and Administration Foundation that Adds to Public Advancement through Exploration and Local area Administration Projects in the Fields of Schooling, Modern Designing and Culture, Advanced education should be additionally urged and worked with to have the option to deliver more developments that are of direct advantage to society. As expressed in the Extension of Clergyman of Exploration, Innovation and Advanced education Guideline No. 13/2015, the program targets and program execution pointers that are straightforwardly connected with research results incorporate working on the nature of advanced education learning and understudy issues.

The inquiry-based flipped learning Semester Learning Plan (RPS) has important points in the preparation of learning design, among others, paying attention to the Learning Outcomes of Study Program Graduates, so that the learning designed is in accordance with the ELOs and answers the needs of the industrial world, among others by paying attention to the SKKNI for the competencies of the study program. Through the formulation of learning design, it requires learning activities that support the achievement of being able to analyse and evaluate. The application of appropriate learning activities is an important point in inquiry-based flipped learning. Lecturers need to design learning activities that are in accordance with the weight of the learning load of the business feasibility study course [2].

The concept of flipped learning model is if it is associated with the reality of business feasibility study learning that has been happening so far, there is still a gap between the acquisition of concepts obtained through the process of providing material in the classroom and the process of discussing case studies and conducting a study of the feasibility aspects of the business to be established or already running. Flipped learning is a learning approach in which the learning environment is transformed into a dynamic and interactive learning environment. Teachers or instructors are tasked to guide students in applying the learning concept. In addition, educators must also be creatively involved in delivering the subject matter. Flipped learning also allows educators to incorporate a wide variety of teaching strategies and learning activities that engage students. Thus, students are more active to fulfil and explore knowledge and maximise interaction with each other.

The peculiarity confronted today is the fast improvement of data and correspondence innovation (ICT). This quick improvement should positively be caught and turned into a worry for the universe of training today. The universe of training should have the option to use ICT and incorporate it with homeroom learning. In view of the portrayal over, the motivation behind this examination is to foster a request based flipped learning model to prepare understudies' basic, imaginative and creative reasoning abilities in business practicality concentrate on courses. The request based flipped learning model is supposed to make

understudies more imaginative, creative and foster decisive reasoning abilities in doing the undertakings given efficiently.

2 Literature review

The learning model is an orderly helping improvement process that utilizes explicit learning speculations to guarantee the nature of learning. The assertion suggests that the arrangement of learning plans should be as per the ideas of training and learning embraced in the educational program utilized. It tends to be inferred that the learning model is the act of planning correspondence innovation media and content to help the compelling exchange of information among teachers and understudies. This interaction includes deciding the underlying status of student figuring out, forming learning targets, and planning media-based "medicines" to assist the progress with happening.

Flipped gaining is a gaining system model created from the customary learning execution process. In flipped learning, understudies learn ahead of time with pre-given learning materials through web-based study hall at home [1]. The course materials can emerge out of different stages. Class gatherings are utilized for bunch learning, conversations, contextual analyses and finishing projects. As per Bregmann and Sams as the originators of this learning idea, flipped learning is an educational methodology where understudies are acquainted with the learning material before class begins, and the in-class time is utilized to develop understanding through conversations with companions or critical thinking contextual analyses and the educator's job is just a facilitator.

The flipped learning model is discovering that joins learning in the homeroom with learning outside the study hall determined to boost learning exercises. Learning exercises that are typically finished in class become done at home. Alternately, learning exercises that are generally finished at home are finished in the study hall. Educators as facilitators bundle learning materials in computerized structure as recordings for understudies to learn at home with the goal that understudies are more ready to realize when in class.

The request model is characterized by [3]. as: Discovering that gets ready circumstances for kids to direct their own trials; in the expansive feeling of needing to see what occurs, needing to follow through with something, wanting to involve images and searching for replies to their own inquiries, associating one revelation with another disclosure, contrasting what is found and what others find. [6] states that request based educating is an understudy focused system where gatherings of understudies into an issue or searching for replies to inquiries in an obviously illustrated technique and gathering structure. In this association, it is important to examine a summed up clarification of request called issue focused request and strategy based request.

Request as a progression of learning exercises that maximally include every one of understudies' capacities to look and explore methodically, basically, intelligently, and scientifically. So they can plan their own discoveries with certainty. As such, request is a cycle to endlessly get data by mentioning observable facts or trials to track down answers or take care of issues to questions or issue details by utilizing basic and intelligent reasoning abilities.

3 Research methods

This kind of study is known as R&D, or research and development. According to [1], the research and development (R&D) technique is "a research method used to produce certain products, and then test the effectiveness of these products."

3.1 Type of Research

This exploration utilizes an innovative work technique where the strategy utilized in this improvement utilizes the ADDIE configuration model (Examination, Plan, Advancement, Execution, Assessment). The ADDIE model was created by [3] to configuration learning frameworks. The means taken in the advancement model comprise of 5 fundamental stages, in particular: In the first place, the examination stage is a necessities evaluation process, distinguishing issues (needs) and directing undertaking investigation, second, the plan stage, at this stage the plan of learning media will be made, in this study the learning media to be delivered through learning recordings, tests, e-modules and others, third, the Improvement stage, this action contains the acknowledgment of the plan of the flipped learning model that is fit to be carried out.

In the event that at the plan stage the utilization of another model/strategy has been planned which is as yet applied, then, at that point, at the advancement stage (Improvement) learning devices are ready or made with the new model/technique like RPS, media and course materials. Then at this stage media approval is completed, and the material will be carried out by media and material specialists. Fourth, the Execution stage, at the execution stage, scientists will carry out learning with a request based flipped learning model. Fifth, the Assessment stage, at this stage, specialists will direct a developmental assessment/evaluation to decide understudy learning results in the wake of carrying out the request based flipped learning model. To decide the possibility of the item, it is important to direct a specialist approval test. The item approval should be possible by introducing a few specialists or specialists who have insight to survey the new item planned. The subjects who approve the results of this innovative work are showing material validators comprising of material specialists and media specialists. Item modifications are made in the wake of going through the plan approval stage. Subsequent to knowing regardless of whether the plan that has been made is substantial, information or data will be acquired as parts of the item that should be fixed and prepared all the more plainly.

3.2 Data types and data collection techniques

The type of information used is qualitative and quantitative information. Qualitative information is obtained through interviews, observations, as well as criticism and advice from validators. The interview was done after the last cycle was carried out. Some students were asked questions referring to the interview guidelines. Quantitative information is obtained through the evaluation of validators using validation sheets and then analyzed using percentage.

3.3 Research Stages

1. Analysis

The purpose of this stage is to establish and define the learning requirements. At this early stage, analyses are conducted to determine the learning objectives and limitations of the material to be developed. The defining stage consists of five steps, namely:

- a. End-start analysis. This step is used to determine the underlying problems faced by the lecturer. Various learning alternatives are considered.
- b. Student analysis. This step is conducted to analyse the students. It identifies student characteristics that are suitable for learning design and development. These characteristics include students' ability, learning experience, and attitude towards learning topics. It also considers the selection of learning media, learning format, and language to be used.
- c. Task analysis. This step involves identifying the key skills required and analysing them into a framework of sub-skills.
- d. Concept analysis. This step is used to identify the main concepts to be taught, organise them hierarchically, and sort out individual concepts.
- e. Formulation of learning objectives. This step is used to convert the results obtained in the task analysis and concept analysis steps into specific objectives.

2. Design

This stage aims to design the prototype of the learning device. This stage begins after the learning objectives are set. At this stage there are four steps which include:

- a. Benchmark test development. This step bridges the first and second stages. Benchmark tests convert specific objectives into an outline of learning materials.
- b. Media selection. This step is carried out to determine the right media or media that is suitable for the presentation of the subject matter, and is carried out after the preparation of the benchmark reference test.
- c. Format selection. This step is closely related to media selection. Choosing the most appropriate format depends on the many factors considered in learning.
- d. Initial design. In this step, the core of the learning process is presented, including the most appropriate media and the activities that will be carried out in learning.

3. Development

The aim of this stage is to produce a prototype of the learning device. Before being implemented, the device that has been created must go through the following two steps:

- a. Expert judgement. This step is done to obtain suggestions for improvement. Several experts are asked to evaluate the learning device. Based on their suggestions, the learning tools are improved so that they are more appropriate, effective, useful, and of high quality.

b. Test for development. In this step, a limited trial was conducted. Based on responses, reactions, and comments from students, observers, and lecturers, modifications to the learning tools are made. The cycle of testing, revising, and retesting is carried out continuously until a consistent and effective learning tool is obtained.

The Develop stage aims to produce and validate the selected learning resources. The resources required for the implementation of the planned lesson must be identified by the teacher to complete this stage of Development. After that, for the implementation of the planned teaching, selecting or developing all the necessary tools, then evaluating the learning output, and completing the remaining stages of the ADDIE teaching design sequence [1]. The result of this stage is expected that lecturers can produce a complete set of learning resources, such as all content, learning strategies, and other RSPs. To support the learning model, educational media and a comprehensive set of directions for each lesson and independent activities that provide a means of building students' knowledge and skills are required. Lecturers will be helped by a comprehensive set of directions in guiding students during the interaction in the planned teaching. Furthermore, during the development stage lecturers develop a formative evaluation design and validate it resulting in a revision. Lecturers should be able to focus on communicating learning well and giving confidence to learners during learning with learning resources presented, so as to fill the gap in learning performance about students' lack of knowledge and skills.

4. Implementation

The purpose of this implementation step is to ensure that students understand the learning environment and are well-prepared for the learning process. The general procedure for this implementation step is to measure the dosage and measure the student. In order for students to begin developing new knowledge and skills that are necessary to address the learners' sense of unhappiness in the learning environment, teachers must adapt to the learning environment. The conclusion of the implementation phase is indicated by the evaluation and development phases. Most ADDIE defenses use the implementation phase to proceed with summative evaluation activities and other strategies that speed up learning. The strategy's implementation is the outcome of this phase. The learning and facilitator roles are the main components of the implementation strategy [1]. Data is gathered to accurately launch the study program so that a sound implementation strategy may be created..

5. Evaluation

This evaluation stage aims to assess the quality of the product and teaching process, both before and after the implementation stage [1]. Determining evaluation criteria, selecting appropriate evaluation tools, and carrying out evaluations are general procedures related to the evaluation stage. Lecturers must identify the level of success of learning, recommend improvements for the next competency with a similar scope and focus on the evaluation stage, the result of this stage is an evaluation plan. A summary that outlines the objectives, data collection tools, timing, and person or group responsible for a particular level of evaluation, a set of summative evaluation criteria, and a set of evaluation tools become common components of an evaluation plan. Lecturers focus on measuring the evaluation plan during

the learning process with students. Learning performance gaps become a guiding reference point for assessment and evaluation decision.

4 Results and Discussion

Based on the objective of this research, it is to produce an inquiry-based flipped learning model that is valid and effective. The development of this learning model was conducted using the ADDIE development model.

4.1 Research Stages

1. Information Gathering Stage

Analyse information from the identification of learning problems

This research was conducted on VI semester students of the Department of Economic Education, Faculty of Economics, State University of Medan in the academic year 2022-2023 in the Business Feasibility Study course. The class that was used as the research subject was class VI A Economic Education consisting of 28 students. At this stage, it was analysed to identify the essential problems faced by students and lecturers in learning. Based on the reality in the field, the essential problems that need attention in learning are:

1. Students are accustomed to the teacher-centred direct instruction system, where they have previously been provided with the material they have to learn.
2. Students often do not know how to work together, especially when they are not given any help (from the lecturer) to make their groups work optimally.
3. There are several problems faced by lecturers in terms of instructional and institutional matters, including:
 - a. Changing the role of lecturers from teachers to facilitators;
 - b. Shifting the authority of learning from what was originally only owned by lecturers to student groups;
 - c. Careful planning of teaching settings, such as timing and efficiency as well as assessment techniques.

Based on researchers observing the learning process at the Economic Education Study Programme, Faculty of Economics, State University of Medan, researchers found several problems related to the learning approach and learning tools used. Researchers saw that lecturers were less creative in developing learning models and lecturers were still more dominant in learning. Most lecturers still use the lecturing method. In fact, the development of students' abilities in the learning process is so fast, so it is time for the lecturer's role to shift slightly from "teacher" to "facilitator" whose obligations in constructing knowledge, seeking information, and creating learning outcomes have been charged to student study groups. Lecturers become individuals who facilitate students in the learning process. Lecturers help students investigate and digest knowledge, control and process group work and coach them throughout the lecture process.

2. Planning Stage

This stage is the initial stage of planning the inquiry-based flipped learning model that will be developed. In the planning stage, the learning model will be developed:

- a) Model syntax/steps
- b) Social system and reaction principle
- c) Support system
- d) Complementary impact

The syntax design of the inquiry-based flipped learning model is presented in the following table:

Table 1. Syntax design of inquiry-based flipped learning model

Stage	Activity Implementation	Description
Stage 1: Orientation	Class	Lecturers condition students to be ready to carry out the learning process through activities: <ul style="list-style-type: none"> • give an apperception • explain the topic • explain learning objectives • explain the expected learning outcomes • distribute learning videos related to the material and problems to be solved/find solutions.
Stage 2: Problem Formulation	Home	<ul style="list-style-type: none"> • Students watch the learning video • Students formulate and understand the problems that have been presented
Stage 3: Hypothesis Formulation	Home	<ul style="list-style-type: none"> • Students develop the ability to hypothesise by formulating temporary answers or can formulate various estimates of possible answers to the problems studied.
Stage 4: Data Collection	Home	<ul style="list-style-type: none"> • Students collect information and preliminary data on the problems given through the learning video.
Stage 5: Testing the Hypothesis	Class	<ul style="list-style-type: none"> • Hypothesis testing is done with the help of the lecturer. This activity can be done in class using the demonstration method. In testing the hypothesis is to find the level of student confidence in the answers given.
Stage 6: Formulate Conclusions	Class	<ul style="list-style-type: none"> • Lecturers guide students in the process of describing the findings obtained based on the results of hypothesis testing. To reach an accurate conclusion, lecturers can show relevant data.

The inquiry-based flipped learning model gives lecturers the role of facilitator in the students' inquiry process and motivator to encourage the process as well as interaction between students in providing problem-solving ideas. The learning atmosphere is open, where all relevant ideas can be accepted.

3. Development Stage

This development stage aims to produce a revised inquiry-based flipped learning model profile so that it is suitable for use in research or piloting. The activities carried out at this stage are: Expert validation, simulation and readability test and limited trial. The results of the activities in the development stage become a reference to assess whether the model profile developed meets the criteria of valid, effective and efficient.

The profile of the validated learning model can be described as follows:

1. Syntax

The aspects considered in validating the syntax are: objectives, material presented, language and presentation process. The results of validation from experts can be summarised in table 2 below:

Table 2. Summary of expert validation results

No.	Assessment Aspect	\bar{x}	Description
1	Destination	3,60	Very valid
2	Facilities and learning aids	3,30	Very valid
3	Learning methods and activities	3,40	Very valid
4	Time	3,20	Very valid
	Average total assessment	3,38	Very valid

The results of the expert validation got an average assessment of the inquiry-based flipped learning model of 3.38 in the very valid category. Table 5.2 shows that the average value of the validity of the syntax is in the very valid category, thus the syntax of this inquiry-based flipped learning model can be used.

2. Social system and reaction principle

The aspects considered in validating the social system and reaction principles are: objectives, material presented, language and presentation process. The results of validation from experts can be summarised in table 3 below:

Table 3. Summary of social system and reaction principle validation results

No.	Assessment Aspect	\bar{x}	Description
1	Destination	3,50	Very valid
2	Material presented	3,75	Very valid
3	Language	3,85	Very valid
4	Serving Process	3,80	Very valid
	Average total assessment	3,73	Very valid

Table 3 shows that the average value of the validity of the social system and reaction principles is in the very valid category with an average value of 3.73, thus the social system and reaction principles of this inquiry-based flipped learning model can be used.

3. Support system

In the preparation of the model support system, several aspects that need to be considered in validating the device are: content components, language aspects and presentation aspects. The validation results can be seen in table 4 below:

Table 4. Summary of validation results Support system

No.	Assessment Aspect	\bar{x}	Description
1	Aspects of the content component	3,60	Very valid
2	Linguistic aspects	3,70	Very valid
3	Aspects of the presentation component	3,80	Very valid
	Average total assessment	3,70	Very valid

From the validation results above, it shows that the average validity value is in the very valid category with an average value of 3.70, thus the support system for this inquiry-based flipped learning model can be used.

4. Accompanying Impact

Aspects that need to be considered in validating the accompanying impact of the learning model are: language and construction. The results of the impact validation can be seen in Table 5 below:

Table 5. Summary of accompaniment impact validation results

No.	Assessment Aspect	\bar{x}	Description
1	Aspects of learning independence	3,80	Very valid
2	Aspects of creativity	3,85	Very valid
3	Aspects of accepting differences	3,87	Very valid
	Average total assessment	3,84	Very valid

From the validation results above, it shows that the average validity value is in the very valid category with an average value of 3.84, thus the accompanying impact of this inquiry-based flipped learning model can be used.

The application of the Flipped learning model (independent asynchronous activities) students are involved in constructing their own knowledge before attending face to face learning with teaching materials that can be accessed through YouTube videos provided by lecturers. Other research also examines the flipped learning method, especially in practical activities in programming lessons. According to [5] research that only utilises practical activities is not enough to measure student engagement. This is due to only one known variable that can affect achievement. Other indicators such as cognitive and emotional engagement are also needed

for better implementation of flipped learning. Therefore, the effectiveness of each face-to-face session is also needed. In-class activities also make students participate more actively in the learning process. They are not only listeners, but can be peer teachers and share solutions from case studies that have been solved.

5 Conclusion

The ADDIE development methodology is used in the Business Feasibility Study course to create an inquiry-based flipped learning model. Five stages were identified for the development of an inquiry-based flipped learning model: (1) analysis of the needs and character traits of the students; (2) learning model design; (3) learning model development; (4) learning model implementation; and (5) evaluation of the application of learning models. The findings demonstrated the validity of the learning model's constituent parts, which included support systems, accompanying impacts, social systems and reaction principles, and syntax. These components had average validity values of 3.70 for support systems, 3.73 for social systems and reaction principles, 3.38 for syntax, and 3.84 for accompanying impacts. These findings suggest that using the inquiry-based flipped learning methodology in the classroom is very likely. This type of learning is ideal for developing students' critical, creative, and inventive thinking abilities as well as their independence and feeling of responsibility.

6 Suggestion

A different option for learning models in other courses in the economics education department specifically and in the learning process overall is the created inquiry-based flipped learning model. This learning approach is excellent for teaching kids how to think critically, creatively, and innovatively as well as how to be independent and responsible. This type of instruction can also help instructors become more creative so they can keep coming up with new ways to provide students with self-directed learning resources.

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References

- [1] A. U. D. Rafiqah, "PENGEMBANGAN MODEL PEMBELAJARAN FLIPPED LEARNING BERBASIS INKUIRI DALAM MATA KULIAH FISIKA DASAR," *J. Pendidik. Fis.*, vol. 9, no. 1, pp. 43–68, 2021, [Online]. Available: <http://journal.uin-alauddin.ac.id/index.php/PendidikanFisika>
- [2] S. Vahlepi, Helty, and F. W. Tersta, "Implementasi Model Pembelajaran berbasis Case Method dan Project Based Learning dalam rangka mengakomodir Higher Order Thinking Skill mahasiswa dalam Mata Kuliah Psikologi Pendidikan Bahasa Arab di Masa Pandemi," vol. 5, pp. 10153–10159, 2021.
- [3] R. Farida, A. Alba, R. Kurniawan, and Z. Zainuddin, "Pengembangan Model Pembelajaran Flipped Classroom Dengan Taksonomi Bloom Pada Mata Kuliah Sistem Politik Indonesia," *Kwangsan J. Teknol. Pendidik.*, vol. 7, no. 2, p. 104, 2019, doi: 10.31800/jtp.kw.v7n2.p104--122.
- [4] M. P. Kurniawidi, M. Fransiska, and T. Gandi, "Pengembangan Pembelajaran Flipped Classroom Dengan Memanfaatkan LMS Kelase Topik Menggambar Grafik Fungsi SMP Kelas VIII," *Pros. Semin. Nas. Etnomatnesia*, pp. 554–561, 2018.
- [5] K. Martikasari, "Pengembangan Model Flipped Learning Pada Matakuliah Ekonomi Regional Untuk Meningkatkan Competence, Conscience Dan ...," *J. Pendidik. Ekon. dan Akunt.*, vol. 14, no. 2, 2021.
- [6] I. Damayanti, "Penerapan Model Pembelajaran Inkuiri Untuk Meningkatkan Hasil Belajar Mata Pelajaran IPA Sekolah Dasar," *J. Penelit. Pendidik. Guru Sekol. Dasar*, vol. 2, no. 3, pp. 1–12, 2014.