



The Use of Learning Cycle Approach in Increasing Motivation and Achievement on the Learning of Economic Mathematics Courses Research for Students of the Islamic Economics Study Program, Faculty of Economics and Business PGRI Wiranegara University

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ABSTRACT

This study is intended to find out how far the use of Learning Cycle teaching model can increase motivation and achievement on economic mathematics in the students of management department. This study applied Classroom Action Research, using the Cycle Learning Model. The result of study indicated that (1) Learning Cycle teaching model makes students have high motivation to study, (2) Learning Cycle teaching model makes students easier to understand a concept, and (3) The students have better achievement when they are taught using Learning Cycle Teaching Model.

INTRODUCTION

Economic Mathematics Lecture serves as core subject in curriculum of management department, economic faculty. The material of economic mathematics lecture consists of mathematics basic concepts, numeric system, superscript, fraction and logarithm, line, functional relation, non-linear relation, calculus algebra, linear algebra, input-output analysis, linear program and game theory that all of which are based on economic science approach. The result of observation on the students where the writer serves as supervisor, related to the level of students' success in joining economic mathematics subject seems still far from what is expected. From 50 students, there are 21 students can't pass the exam of this subject, even some of them have joined this subject twice, but do not pass anyway. 20 students get C grade and the rest get B- and C grade. Based on the result of interview with students, there is information that their failure in economic mathematics subject is caused by the fact that they feel difficult to understand the material presented by the lecturer. Because of this feeling, students become passive at class, they will not ask any question.

With this condition, in fact the learning process of economic mathematics lecture is very challenging either for lecturer or for students. This is resulted by the material in the shape of concepts and applications, besides the presentation time is limited, in fact the material presented is abundant. Limited time makes learning economic mathematics concepts only just for fulfilling curriculum target. If the presentation of economic mathematics lecture for abundant material for fairly short time occurs continuously, therefore the teaching of economic mathematics lecture will become boring lecture. Students may not aware that economic mathematics lecture is very important to understand as basic knowledge to understand another core subjects, such as macro-economy, micro-economy, statistics, financial management, quantitative method, etc.

The result of interview conducted by the writer toward the students provide further information that from 50 students, only two students did not ask any questions and four students raise their hands to do exercises in front of class and the rest write down lecturer's explanation. This information indicated that lecturer has made the students active to study through asked questions, but only certain students who actively respond. The other students seem passive in studying, they tend to write down lecturer's explanation. The condition indicated that students' activeness to study is low.

Also based on the result of interview toward other students and the result of the writer's observation toward learning process at class, therefore research team carried out discussion to classify the problems underwent at class. In the discussion, it is agreed that beside low study result, the problems encountered in learning process is the fact that the students are less active at class. The cause of both problems is the method applied by the lecturer, namely classic learning method in term of speaking combined with question and answer. Besides the students still feel depressed studying at class for being afraid of lecturer's questions or asked to do exercises in front of class. Therefore, there should be a method that can make more conducive learning situation. To solve this problem, research team and the lecturer of the subject make a study. Inactiveness of the students in front of class occurred because of less distributed

tasks given by the lecturer to the students. The demand in order the students to answer the questions presented at present is voluntariness, hence students feel not obliged to answer them. Besides, there is possibility that lecturer's questions in front of class became a burden for the students that they feel afraid. The exercises or questions should be better to do in small groups that students in the group may discuss and have responsibility on their groups' success. To increase students' motivation in studying economic mathematics lecture, the relationship between the concepts they studied and the use in daily life should be explained.

LITERATURE REVIEW

Team agreed with the solution of this learning problems conducted through constructivism approach, namely with learning cycle method (Townbridge & Bybee, 2016). From many existing constructivism methods, learning cycle method can accommodate the problems of learning economic mathematics lecture. Learning process in this method depends on the students comprising 5 stages of learning processes, namely engagement (identification level), exploration level, explanation level, elaboration and evaluation level (Lorsbach, 2022).

Learning cycle method is developed with the purpose to change objectivism-oriented learning to constructivism-oriented learning. Constructivism oriented learning will help students to construct concepts/principles with their own abilities through internalization process until the concepts/ principles are built, therefore according to Suhartadi (2023), learning cycle as science learning method is in consistence with learning theory on how students learn.

With learning cycle model, students are expected to play active role in studying process and relate the concepts they learned at class with daily life problems. This learning condition may increase study motivation that in turn will affect the improvement of studying result. Referring the background of the problem stated above, therefore the problems to solve in this study may state as following: (1) Can the use of learning cycle model increase the motivation of management students in economic mathematics lecture? (2) Can the use of learning cycle model improve studying result of management students in economic mathematics lecture?

METHODOLOGY

This study was conducted in Management Department, Economic Faculty, Malang State University. The subject is students joining economic mathematics subject involving 2 lecturers. The material used is functional relationship. Meanwhile the learning method applied is Learning Cycle. This study applied Class Treatment Research approach. With this approach, the cycle of research lines may be carried out as following:

Planning → Implementation → Observation → Reflection

Problem solving is started by collecting data directly through class observation at class. The formula of problem solving is arranged together by lectures and research team. Before the lecture conducting learning process at class, there is peer teaching between lecturer and researcher. The description of research stages is presented in Table 1.

Table 1. The Description of Research Stages

No	Activity Stages	Process
1	Pre-Research	<ul style="list-style-type: none"> ○ Direct observation on learning process at class. ○ Discussion between lecturer and research team concerning the problems at class. ○ Formulating the occurred problems. ○ Identifying main problems. ○ Arranging solution hypothesis.
2	Initial Planning	<ul style="list-style-type: none"> ○ Lecturer and team discuss teaching materials according the problems. ○ Arranging learning plan/ scenario. ○ Collecting materials and media. ○ Learning ○ Conducting <i>peer teaching</i> to carry out the learning. ○ Discussing <i>peer teaching</i> result.
3.	Implementation of Learning at Class and Observation.	<ul style="list-style-type: none"> ○ Lecturer teaches based on the plan arranged together, and in accordance with the training in <i>peer teaching</i> ○ Another research team observes and record the occurred process. ○ Discussion between lecturer and research team concerning the implemented plan. ○ The evaluation of learning implementation, recording the existing obstacles and weaknesses.

4.	Reflection	<ul style="list-style-type: none"> ○ Formulating and identifying the problems in learning implementation stage 1. ○ Making new plan to solve the problems.
5.	Planning II	<ul style="list-style-type: none"> ○ Completing or reviewing teaching plan before. ○ <i>Peer teaching</i> for the following learning. ○ Discussing the implementation of <i>peer teaching</i>
6.	Learning Implementation at Class and Observation II	<ul style="list-style-type: none"> ○ As Stage 3, followed with reflection.
7.	Continue	Continue

In short, the process of treatment process cycle is presented in Figure 1 below

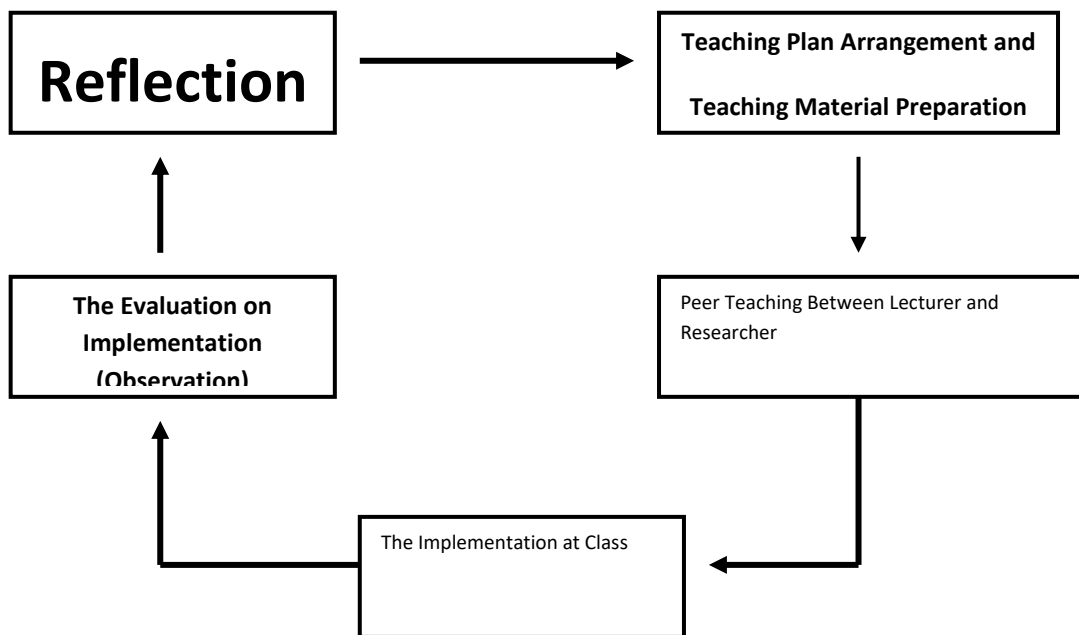


Figure 1. Class Treatment Research Cycle Process

The learning implementation at class is conducted with Learning Cycle model comprising engagement/identification level (initial support for students related to the concepts that will be discussed and the attempt to enhance students' motivation and curiosity), exploration (new concept exploration level through group experiment/discussion or the level of hypothesis/prediction test on a concept), explanation (the level of presenting exploration result conducted through class discussion), elaboration (the level of implementing concept and skill in new/another situation), and evaluation (the level of evaluating the comprehension on newly learned concept).

Instruments of the study consist of learning materials, learning scenarios, observation sheets, questionnaire for students, and comprehension test. The instruments are arranged by researcher and before application, they should be discussed first with the lecturer. The data are analyzed in qualitative and quantitative (descriptive) ways.

Performance Indicator

To find out the success level in reaching the determined objective, performance indicator is applied as following:

Table 2. Performance Indicator

Research Title	Program Objectives	Performance Indicator
The Use of Learning Cycle Approach in Increasing Motivation and Result of Study on Economic Mathematics Lecture in The Students of Management Department, Economic Faculty, Malang State University.	<p>To find out the effectiveness of using learning cycle model in improving students' studying motivation.</p> <p>To find out the effectiveness of using learning cycle model in improving students' studying result.</p>	<p>To improve students' studying motivation, measured from the indicator of student's number actively participating in studying activities such as asking and answering question, actives in discussion, curiosity, seriousness and punctuality in finishing the tasks.</p> <p>To increase students' studying result, measured with test score indicator, written test and action, referring to the learning objective.</p>

RESULT AND DISCUSSION

Cycle I

Cycle I was conducted in 1 November 2024 continuously in class E.5.206 and E.5.207 at hour 1-2 and 3-4. The topics studied are (1) Mathematics basic concepts comprising understanding compound theory, understanding numeric system and calculation lines that consist of calculation lines and measurement lines. (2) Understanding functional relationship and linear relationship concepts in economic science. The first and the second topics are studied through group discussion followed with class discussion (learning materials serve as reference), meanwhile the second topic is studied through discussion but followed by exercises in group. The activities in cycle I follows Learning Cycle pattern, namely through the stages of Engagement, Exploitation, Explanation, Elaboration, and Evaluation. The treatment was conducted by economic mathematics lecturer, meanwhile research team works as observer. Students' will and actives in this activity is recorded in observation sheets, meanwhile

students' studying result is measured with evaluation tools provided in the end of activities.

Students' will and actives seems increasing from engagement level. They with enthusiast answer the questions on mathematics basic concepts. Students also seriously do the exercises provided. One thing noticed by the observer is that every time the lecturer asks question and the students answer together, there is no argumentation among groups. These weaknesses can be overcome through optimization of lecturer's role as moderator of class discussion. One positive thing that can be reported is that in discussing the activity result through class discussion, students in fact have function their thinking ability well, especially when discussing the difference of numeric system, the difference of calculation lines and measurement lines. The result of students' test is around 50-80 for II F and 53-80 (see Attachment).

Without forgetting the weaknesses, the effectiveness in implementing cycle I may mostly be supported by the following things: (1) the observed concepts are the real ones in students' life, (2) students' longing for discussion activities that they seldom do in happy condition without stress and afraid, and (3) students' curiosity on the implementation of mathematics concepts of economic science that is related to daily life.

Cycle II

Cycle II was carried out at 8 November 2024 in Class E.5.202 and E.5.201 continuously at hour 1-2 and 3-4. The topic studied is the implementation of measurement and calculation lines in economic science. This topic is studied through group discussion, exercises and question and answer. The activities of Cycle II also follow Learning Cycle pattern, namely through the stages of engagement, exploration, explanation, elaboration, and evaluation. The treatment was conducted by economic mathematics lecture, meanwhile the researcher and another research team members work as observer. Engagement level is started with review of last Activity I result, followed with the questions on mathematics basic concepts and the ones of calculation and measurement lines. Continued with exploration level in the shape of exercise doing the question provided by the lecturer, namely the problem of implementation in economic field where the sample is related to daily life condition. The practice in doing the test can be seen in attachment sheet. Students' will and actives in this activity is recorded in observation sheets, meanwhile students' studying result may be measured with evaluation tools presented in the end of activities.

Students' will and actives seems increasing from engagement level. They with enthusiast answer the lecturer's questions on calculation and measurement lines. Students also seriously do mathematics exercises. One important thing noticed by the observer is that the lecturer succeeds becoming good moderator in class discussion, for together answers of class is changed with argumentative answers of each group every time there is question. In this cycle, students function their thinking ability well, this is indicated with the ability of students to conclude discussed topic scientifically. Besides the result of students' test is around 60-80. Without forgetting the weaknesses, the effectiveness in implementing cycle II may mostly be supported by the

following things: (1) the observed concepts are the ones closely related to economic problems, (2) practical topic in term of test exercises is very interesting and not yet be conducted in happy condition, free from stress and anxiety, and (3) students' high curiosity on the essential implementation of mathematics in economic science.

Cycle III

Cycle III was carried out at 15 November 2024 in Class E.5.201 and E.5.202. The topic studied is the concepts of functional and linear relationships in economic science. The activities of Cycle III also follow Learning Cycle pattern, namely through the stages of engagement, exploration, explanation, elaboration, and evaluation. The treatment was conducted by economic mathematics lecture, meanwhile research team works as observer. Engagement level is started with review of last Activity 2 result, followed with the questions on students' comprehension level on basic concepts of linear of non-linear functional relationship. Continued with exploration level in the shape of exercise doing the question dealing with the problem of implementation in economic field. Students' will and actives in this activity is recorded in observation sheets, meanwhile students' studying result may be measured with evaluation tools presented in the end of activities.

Students' will and actives seems increasing from engagement level. They with enthusiast answer the lecturer's questions on studied materials. In fact, the best way to solve the problems is by discussing them in group level, where lecturer serves as facilitator, followed by doing the exercise by another group, then brought from class discussion. If this pattern is carried out with optimum participation of students, students' curiosity can be enhanced without any fear or anxiety, for their friends have understand the material of mathematics through doing the test, should explained to another friends. In this case, the students who understand more rapidly will not feel smarter, and vice versa, the students who understand later do not feel dull. Class situation become productive. With this pattern of learning, in fact the students' test result increases around 70-100. Therefore, it can be concluded that the effectiveness in implementing cycle III may mostly be supported by the following things: (1) the observed concepts are the ones closely related to economic problems occurs daily in their environment, (2) students' high curiosity on the essential implementation of functional relationship topic in economic field and furthermore the student's study at class with happy situation without any stresses.

The Improvement of Students' Motivation and Studying Result

From three cycles implemented, the motivation and perception of students are considered good. The conclusion is supported by the data presented in the table below.

Table 2. The Result of Questionnaire on Students' Attitude Toward Economic Mathematics Lecture

NO	QUESTION	Attitude				
		1	2	3	4	5
1	Do you feel possessing new knowledge on Mathematics after joining this lecture?				15	25
2	Do you feel happier after joining Mathematics lecture with this method (Learning Cycle)?				5	35
3	Are you satisfied with economic mathematics lecture materials?				11	29
4	Are you satisfied with the existing studying situation?				3	37

Description: 5 = Very satisfied, 4 = Fairly Satisfied, 3 = Satisfied, 3 = Unsatisfied, 1 = Very unsatisfied.

From the data above, it is found out that the number of students who feel obtaining new knowledge of Mathematics after joining lecture with learning cycle model with fairly satisfied category is 15 persons from 40 students or about 37.5%; meanwhile the ones with category very satisfied is 25 persons or about 62.5%. For the second question namely: Are you happier joining Mathematics lecture with this method (Learning cycle)? The answer of the students with fairly satisfied category is 5 persons or about 12.5%, meanwhile the ones with very satisfied category is 35 students of 87.5%. Furthermore, for the third question, namely: Are you satisfied with economic mathematics lecture material? The students answering fairly satisfied is 11 persons or about 27.5%, meanwhile the ones with very satisfied category are 29 persons or about 72.5%. The last question asked, are you satisfied with the existing learning situation? The result of questionnaire indicated that the students state fairly satisfied is 3 persons or about 7.5%, meanwhile the ones with very satisfied category is 37 persons or about 92.5%.

Table 3. Some Students' Impression on Learning Activities at Class

No	Students' Impression
1	Learning Cycle Model make studying economic mathematics as a lecture become easy.
2	The studying situation become conducive since the students do not feel stressed or anxious.

4	This learning model should be conducted in all subjects therefore the students may obtain optimum result.
5	Lecturer's role as facilitator makes studying situation familiar.

Table 3 indicated some students' impression on learning cycle model. The impressions above indicate that students have positive attitude toward learning model applied in this instruction processes. Students said this model makes economic mathematics lecture becomes easier to study, studying situation becomes more conducive, learning cycle supports the achievement of optimum studying result and lecturer's role as facilitator make more familiar studying situation.

Table 4. The Score of Students' Attitude on Learning Cycle Model

No.	Statements	Average Score of Attitude
1	I feel possessing new knowledge on Mathematics after joining this lecture.	4,65
2	I fell happier after joining Mathematics lecture with this method (Learning Cycle).	4,88
3	I feel satisfied with the material of economic mathematics lecture.	4,96
4	I feel satisfied with the existing studying situation.	4,93

With score around 1 - 5 to determine students' attitude toward learning cycle model on Economic Mathematics lecture, the data on students' attitude toward this learning model is very positive, noticed from the score above 4.5.

Table 5. The Improvement of Average Students' Score after Applying Learning Cycle Model

Class	Average Score of Cycle 1	Average Score of Cycle 2	Average Score of Cycle 3
Management	61,22	75,63	89,35

From the data above, it is found out that average students' score always improves from cycle I namely 61.22, becomes 75.63 in cycle II and increases to 89.35. This means that learning cycle model is effective toward students' motivation and performance.

The Weakness of the Research

Beside positive results achieved in this study, however there are also weaknesses that should be presented in research process; therefore, it will become input for the researcher to improve this model of research for next time. The weaknesses of this study: (1) Limited time of study in applying learning

cycle model. Therefore, the observed materials in this learning model are also limited. In fact, the result of this learning model may be considered effective or not if it is applied for fairly long time, at least one semester, therefore the number of materials is sufficient. If it can be conducted therefore the effectiveness level of this model to increase students' studying motivation and achievement may be considered more perfect. (2) Can this learning model bring basic attitude change for the students in studying? This cannot be presented in detail, for it requires further research to uncover whether this Learning Cycle model also brings basic attitude change for students in studying.

CONCLUSIONS AND RECOMMENDATIONS

The conclusion inferred from this study is: (1) Learning Cycle teaching model makes students have high motivation to study, (2) Learning Cycle teaching model makes students easier to understand a concept, and (3) The students have better achievement when they are taught using Learning Cycle Teaching Model. The perfect preparation of learning process influence students' studying process coherence and result. The second factor affecting learning success is the presence of studying time, in another worlds the implementation of this model requires more time than conventional learning model.

Based on this result of study, it is suggested (1) There should be further similar class treatment research with other subjects considered difficult for students, such as financial management, budgeting, quantitative method, etc. (2) There should be class treatment research with the same concept on different department in economic faculty such as accounting department, economy and development study.

FURTHER STUDY

This research still has limitations so further research on this topic is still needed "The Use of Learning Cycle Approach in Increasing Motivation and Achievement on the Learning of Economic Mathematics Courses Research for Students of the Islamic Economics Study Program, Faculty of Economics and Business PGRI Wiranegara University".

REFERENCES

- Abraham. M.R & Renner, J.W. 2016. *The Sequences of Learning Cycle Activities in High School Chemistry*. *Journal of Research in Science Teaching*. 23, 121-134.
- Lorsbach, A. W. 2022. *The Learning Cycle as A tool for Planning Science Instruction*. Online <http://www.coe.ilstu.edu/scienceed/lorsbaciai/257lrcy.html>, diakses 10 Desember 2022).
- Renner, J. Abraham, M.R & Birnie, H.H. 2015. *The Importance of the Form of Student Acquisition of Data in Physics Learning Cycle*. *Journal of Research in Science Teaching*. 22, 203-325.
- Suhartadi, S. 2023. *Pengembangan Model Pengajaran Teknik Berbasis Siklus Belajar*

Sangadji

Untuk Meningkatkan Kompetensi Life-Skill Lulusan SMK Teknologi.
Malang: Lembaga Penelitian UM

Trowbridge, L. W. and Bybee, R.W. 2016. *Teaching Secondary School Science: Strategies for Developing Scientific Literacy (6'h Ed.)*. New Jersey: Prentice-Hall.