Can Reflective Thinking Develop Students' Metacognition in the Microeconomics Course?

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Economics learning prepares students to deal with various decision-making processes and there is a need on independent learning. This study aims at investigating a reflective thinking approach to teaching microeconomics to enhance students' metacognitive abilities. The study involved a quantitative research approach using a self-administered survey to collect data from participants. The findings indicate that reflective thinking method can be used to identify students' learning challenges and to find solutions to cope their problems. In particular, the majority of students found difficulties in some chapters, such as profit calculation and pricing in imperfectly competitive markets, as well as game theory and competitive strategy. In addition, students can propose solutions by involving additional resources, e.g., textbooks and YouTube videos.

Keywords: metacognitive development, microeconomics, economics understanding, learning plan

INTRODUCTION

In the economics course, the teaching and learning activities emphasize to enhance economic literacy and shaping the economic attitudes, skills, and behaviors of students (Batty et al., 2015). Some prior studies have shown that learning economics concerns with decision-making processes to deal with daily problems (Long et al., 2017; Mankiw, 2020). The presence of digitalization and technological development leads to a more complex problem. For instance, economics students are aware that no seller is willing to incur losses. However, many students are still drawn to irrational behavior offered by sellers, such as "buy one, get two" or similar forms (Hussin, 2018; Amri et al., 2020). Therefore, it is prominent to provide students with independent learning in order to apply their economic knowledge to practical situations and ensure that

their attitudes and behaviors are consistent with their understanding of economics as well as promote rationale economic behavior.

The microeconomics course provides students with an opportunity to acquire economic knowledge that can robustly impact their attitudes and behavior (Mankiw, 2020). The matter of microeconomics is to alter the way students perceive their economic lives and the decisions they make (Akerlof & Kranton, 2022). Some recent studies have identified nine obstacles that instructors must overcome when designing effective and optimal learning experiences (e.g., Chew & Cerbin, 2020; Hoyt & O'Sullivan, 2021). These obstacles cover with some issues regarding mindset, metacognition, fear and mistrust, prior knowledge, misconceptions, learning strategies, transfer of learning, selective attention, mental effort, and working memory (Hoyt & O'Sullivan, 2021). Hence, efforts to deal with these issues can help educators to provide a more enjoyable and effective teaching and learning experience for their students.

Students' awareness to learn independently and to conduct self-evaluation is prominent for the development of metacognition in the field of microeconomics (Reavey & Zahay, 2022). With self-reflective learning undergoing self-evaluation, students can identify the strengths and weaknesses of their knowledge, attitudes, and behaviors especially related to the concepts in microeconomics (Akosile & Ekemen, 2022). In this case, students who able to identify their weaknesses, they can perform independent learning activities to reduce learning difficulties. In this regard, the role of educators is prominent in fostering metacognitive development among students (Zohar & Barzilai, 2015). Educators can uplift students to reflect on their learning process and provide feedback on their learning process (Gan et al., 2015). In addition, it can guide students on how to set achievable learning goals and acquire meaningful learning (Goffe, 2021).

Therefore, this study aims to investigate students' metacognitive abilities in microeconomic course using self-reflective learning. This study makes a significant contribution to the literature on economics education, particularly in the area of microeconomic learning. Second, it provides guidance for educators in improving students' metacognitive abilities. Third, this research contributes to the field of economics education by investigating the measurement of reflective thinking and the enhancement of metacognitive skills among university students. Metacognition has been studied in various educational settings (e.g., Wardoyo et al., 2021; Mitsea & Drigas, 2019), while specific application and impact on economics education are relatively under explored. This research addresses this gap by examining the potential benefits of incorporating reflective thinking exercises in microeconomics courses.

The paper is structured as follows: The first section provides the background of the study, accompanied by methodology in the next section. Further, it presents the results of study, and the conclusion is provided in the last section.

RESEARCH METHODS

Research Design

This study is intended to provide learning materials in microeconomics in enhancing metacognition among university students in Indonesia. This present study adopted quantitative research with self-administered reflection survey to gain prior knowledge about learning difficulties, challenges, and opportunities in learning microeconomics, which further can create appropriate learning plan. This study was performed in microeconomics course since it deals with individual's daily economic activities and decision-making process.

Participants, Instruments and Measurements

The research subject is economics education students who involved in microeconomics course. This study involved a limited experiment at Universitas Negeri Malang and further implemented in other universities in Indonesia, i.e., Universitas Negeri Surabaya and Universitas Negeri Medan. The explanation of conduction studies in this university is that Universitas Negeri Malang is the pioneer of educational-based university in Indonesia. The students were identified for their metacognitive ability using instruments from metacognitive awareness inventory (MAI) consisting of declaration knowledge, procedural

knowledge, conditional knowledge, planning, information management strategies, comprehension monitoring, debugging strategies, and evaluation.

Procedures

The procedures of this research are provided as follows. At the beginning, the researchers conducted a preliminary survey and analyzing the needs of students taking microeconomics courses. During this process, the students were asked for their requirements for online learning activities. The results of this process in provided in Table 1. The next step is to provide the learning materials based on the self-reflection at the previous stage. Third, provides guidance for reflective thinking approach in encouraging metacognition. The draft guidelines based on the evaluation of the results of the limited trial. At this stage, discussions were held with the research team. The last stage is providing test to measure metacognition ability among university students and data analysis.

RESULTS AND DISCUSSION

This research was intended to identify the difficulties of university students in learning microeconomics and provide learning activities using reflective thinking approach in order to enhance metacognition of students. This research was performed to accommodate the lack of distance learning to have same benefit as face-to-face learning.

Preliminary Analysis

To understand metacognition among economics students, it requires to identify students' needs during learning activities. Table 1 shows the students' activities during learning in microeconomics that are linked to metacognition. As informed in the Table, students are less enthusiastic about listening to materials from lecturers, and the presentations are inadequate (39.44%). The mapping of this preliminary survey notes that students are more interested in materials from videos provided in the learning management system (LMS), whether made by the lecturer or general relevant materials attached in LMS. It is because they can be replayed many times to enhance their knowledge and information.

TABLE 1
ONLINE LEARNING ACTIVITIES REQUIRED BY STUDENTS

Activities	Students	%
Reading reference books	71	100.00
Discuss with friends	71	100.00
Conducting question and answer activities between students and students with lecturers	60	84.51
Provision of discussion forums for both small group and class	51	71.83
Task work	42	59.15
Listening to the lecturer's explanation online	32	45.07
Presentation by individual or group students	28	39.44

In addition, we also provided a survey on students' metacognition using criteria from metacognitive awareness (see Table 2). This preliminary survey was performed at Universitas Negeri Malang and involving 37 students in a microeconomics course. The students were identified for their metacognitive ability using instruments from the metacognitive awareness inventory (MAI), consisting of declarative knowledge, procedural knowledge, conditional knowledge, planning, information management strategies, comprehension monitoring, debugging strategies, and evaluation. Table 2 informs that the majority of students have metacognitive ability in the category of average with a percentage of 48.65%, followed by good category (29.72%), and inadequate (21.65%), respectively.

TABLE 2
INITIAL OF METACOGNITION ABILITY OF STUDENTS

Criteria	Range	Total Students	%
Excellent	>91	0	0
Good	83-91	11	29.72
Average	74-82	18	48.65
Inadequate	65-73	8	21.63
Poor	<65	0	0

Development of Learning Materials

From the results of the preliminary analysis, it requires to present a learning design using a reflective approach in order to increase students' metacognition. In more detail, we used the standard curriculum for microeconomics in Indonesia and provided the students with learning activities (see Table 3). Furthermore, guidance on using reflective thinking approach for microeconomics is shown in Table 4.

TABLE 3
LEARNING ACTION PLAN IN MICROECONOMICS

No	Achievement Standard of Subject	Students Learning Activities
1.	Analyze the balance of the market in the short and long-term, so can formulate the right policy through the study of price fluctuation phenomena.	• Study reference books on market mechanisms, demand and supply • Answer questions between student and facilitator • Create a case analysis report
2.	Evaluate consumer and producer behavior in the face of economic problems	• Facilitator informs consumer and producer behavior cases. • Discuss and answer questions through the online forum
3.	Understand the concept of game theory and strategy of competing in the competitive market is imperfect.	• Studying references about the competitive market is imperfect. • Answer questions between students and facilitators. • Create a case analysis report
4.	Analyze the company's input needs in various forms of the input market	• Facilitator informs the case of producer behavior in maximizing profits. • Ask questions and answer through the discussion forum
5.	Analyze the interrelationship of externality, public goods and general well-being through the examination of cases of externalities in society	• The facilitator informs the empirical case of externality • Ask questions and answer questions. • Students create videos of problems and externalities solutions

TABLE 4
ESSAY QUESTION TO PROMOTE REFLECTIVE THINKING

No	Area	Question
1.	Benefit	What benefits from microeconomic course?
2.	Difficulties	Which material of the microeconomics is not well understood?
3.	Reflection	Why is it difficult or not understandable?
4.	Effort to solve	What efforts to overcome the difficulties in microeconomics course
5.	Hope and satisfaction	How can learning activities encourage learn independently?

Based on the guidance in Table 4, we encouraged students to engage in self-reflection using provided indicators from reflective learning. During this stage, we interviewed 37 students and asked them to list their material difficulties, causes of difficulties, and efforts to deal with the issues. The details of mapping the difficulties of microeconomics materials are provided in Table 5. The majority of students (68%) involved in this research agreed that profit calculation and pricing in imperfectly competitive markets were the major issues, followed by materials on game theory and competitive strategy (65%), and calculation of long-term production costs (55%), respectively.

TABLE 5
MAPPING OF ECONOMICS MATERIALS DIFFICULTIES

No	Material	%
1.	Profit calculation and pricing in imperfectly competitive markets	68
2.	Game theory and competitive strategy	65
3.	Calculation of long-term production costs	55
4.	Concept, interpretation of elasticity and implications for the company	37
5.	General welfare theory	35
6.	Input market, especially capital market, labor market	25
7.	Consumer behavior using attribute approach	10

For this reflective learning activity, students are asked to identify the causes of difficulties they encountered while learning course materials. Table 6 presents the results of a survey conducted among 37 university students at Universitas Negeri Malang who were enrolled in the microeconomics course. The survey revealed that the majority of students faced difficulties in understanding curves and mathematical calculations (70%), and in relying solely on PowerPoint materials instead of reading reference books (70%). Interestingly, language in reference books was not a significant barrier for students.

TABLE 6
CAUSES OF DIFFICULTY UNDERSTANDING THE MATERIAL

No	Description	%
1.	Less active in learning, less self-study motivation	60
2.	Weak in understanding curves and mathematical calculations	70
3.	Solely reviewing Power point material instead of reading reference books	70
4.	Asynchronous online lectures are less able to follow, prefer synchronous or offline	20
5.	Reference book language	10
6.	Material delivered in group presentations	30

Reflective learning also enables students to provide solutions regarding with their proposed problems. Table 7 informs that the majority of students provide solutions by reading reference books and other

relevant sources (80%), learning material from videos via YouTube (80%), and discussing with peers via online chat and face-to-face (60%). While there are few students who make summary to deal the difficulties of learning.

TABLE 7
STUDENTS EFFORTS TO SOLVE THE ISSUES

No	Activities	%
1.	Read reference books again and other relevant sources	80
2.	Learn material from videos via YouTube	80
3	Print the material provided and reread it by giving notes/doodles	40
4.	Ask and discuss with peers via chat or directly	60
5.	Make own summary	20
6.	Motivate to be active in self-study, chat with parents to increase motivation	10

After providing reflective learning activities using the guidance proposed previously, we administered a self-assessment survey to the experimental class in microeconomics. The results showed a notable improvement in metacognitive ability among students (see Table 7). Prior to the intervention, the majority of students were in the average category, while after implementing reflective learning, the majority of students were in the excellent (43%) and good (30%) categories. There were no students in the poor category after using reflective learning.

TABLE 8
RESULTS OF THE INITIAL METACOGNITIVE MAPPING OF STUDENTS

Criteria	Range	Total Students	%
Excellent	>91	16	43
Good	83-91	11	30
Average	74-82	8	22
Inadequate	65-73	2	5
Poor	<65	0	0

Table 9 informs the comparison of metacognition of students in other universities, including Universitas Negeri Surabaya and Universitas Negeri Medan. The results indicates that students at Universitas Negeri Surabaya have a greater metacognition ability. As informed in the table, 53% of students were in the excellent category, followed by students in good category (26%). On the other hand, students at Universitas Negeri Medan have 35% students in the excellent category and 29% students in the average category.

TABLE 9
COMPARISON OF METACOGNITION OF STUDENTS IN OTHER UNIVERSITIES

Criteria	Range	Universitas Negeri Surabaya		Universitas Negeri Medan	
		Nominal	%	Nominal	%
Excellent	>91	20	53%	12	35%
Good	83-91	10	26%	3	9%
Average	74-82	6	16%	10	29%
Inadequate	65-73	0	0%	4	12%
Poor	<65	2	5%	5	15%

Discussion

This study aims to promote students' metacognitive ability using a reflective learning approach. The findings indicate that the reflective learning approach can provide better metacognition among university students. The findings are consistent with some preliminary papers (e.g., Daradoumis & Arguedas, 2020; Achuthan et al., 2017; Graham & Phelps, 2003) which showed this relationship. The basic explanation to support this result is that the reflective learning approach enables students to gain independent learning, providing an opportunity for students to actively engage with their learning and develop their metacognitive skills (Dori et al., 2018). The aforementioned studies remarked that reflective learning also encourages self-awareness, as it allows students to identify the main problems in their learning process.

In addition, reflective learning enables students to develop their critical thinking skills, which are crucial in microeconomics—the study of how individuals and firms make decisions to allocate the existing resources (Lusardi & Mitchell, 2017). Preliminary studies noted that the process of reflective learning involves higher-order thinking skills, e.g., analysis and evaluation, which are essential components of metacognition (Wardoyo et al., 2021). This finding is supported by Schraw et al. (2006) which pointed out that self-reflective learning enables students to regulate their own learning, an essential aspect for metacognition. Despite metacognition is not integrated with the main purpose in economics learning, the enhancement of this ability is important for students to confront with this digital era (Carvalho & Santos, 2022).

The findings of this study have several implications. First, the finding show that self-reflective learning to enhance metacognition among students is a continues process. The result raises a demand for curriculum development to promote students' metacognition. Second, the involvement various learning approach in the classroom requires educators' competencies. Thus, university can provide some development programs for educator to enhance their knowledge, skills, and behavior on how to manage students. Lastly, it needs to pay attention on the role of digitalization and technological development that can be involved in the learning activities, in which can provide a more meaningful learning.

CONCLUSION

This study aims to examine reflective learning approaches to enhance students' metacognition. This study provides several essential findings. First, reflective learning helps students identify weaknesses in their understanding and learning outcomes. In the context of microeconomics, students face difficulties in several topics, such as profit maximization on imperfect competition and game theory. Students also documented their difficulties in understanding curves and mathematical calculations. To deal with, self-reflective learning enables them to find and implement solutions to overcome these weaknesses, such as searching for learning resources on the internet in the form of articles and learning videos on YouTube.

Second, the implementation of reflective learning successfully promoted metacognition among Indonesian university students. This research has practical implications for economics educators and instructional designers. It provides concrete evidence to support the integration of reflective learning activities into the microeconomics curriculum in order to improve students' metacognition. Later, this study provides a practical approach for educators to enhance students' metacognitive abilities and improve learning outcomes. Lastly, the insights gained from this study can potentially be applied to other academic areas that can contribute to a deeper understanding of metacognition and its role in fostering students' accomplishment.

As with other papers, self-administered surveys lie to possibility of bias, e.g., social desirability bias, which can impact on the accuracy and reliability of the data analysis. Therefore, future scholars can adopt a mixed-method study to gain a more comprehensive understanding regarding students' experiences, perceptions, and learning outcomes.

ACKNOWLEDGEMENT

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