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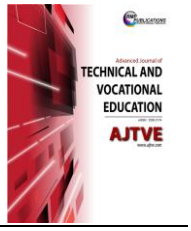

Magnetonomics as Teaching Aid in Learning Macroeconomics

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Abstract: Macroeconomics is a compulsory subject for those enrolled in business programs at Polytechnic across Malaysia. A study on the student performances shows that students struggle with the basic concept of macroeconomics such as the circular flow of economy, whereas the lecturers struggling to explain this concept to them. Therefore, an innovative approach such as *Magnetonomics* which utilise magnet technology is needed to ensure such concept is not just comprehensible, but also would be retained longer in their memory. A 4-points Likert scale questionnaire was distributed to 46 respondents from Commerce Department students of Politeknik Sultan Azlan Shah. The results show that, in overall students interested with the used of *Magnetonomics* in learning Macroeconomics. The study findings also show the score mean for pre-test using video as teaching aid is 3.3 whereas the score mean for post-test using *Magnetonomics* is 3.5434. This indicate that *Magnetonomics* is significant as a tool in teaching macroeconomics.

Keywords: *Macroeconomics, circular flow of economy, magnet technology, visual learning*

1. Introduction

Macroeconomics is a compulsory subject for those who enrolled in business programs at Polytechnic across Malaysia. A common core subject for some program such as accountings and retailing and a discipline core for a program such as business studies, this subject aims to equip the students with the knowledge and understanding of the economy-wide events that are related to their field of study. Upon completion of this course, students should be able to explain among others the importance of macroeconomic theories to overcome the economic problems. However, the data on the group attainment of the Course Learning Outcomes (CLO) scores throughout June 2017 until June 2020 for Politeknik Sultan Azlan Shah commerce students show that on average, they only scores 53.5% for CLO 1, 61.3% for CLO 2 and 70.2% for CLO 3. Although the scores passed the 50% marker set up by the department, the scores are still less than desirable and needed improvement. Understanding how the macroeconomy works can be challenging because a great deal is going on at the same time. Explaining complex interaction between various sectors in economy is a daunting task and a learning tool is needed to help with the explanation. As Lee Chiong Wee [1] pointed in his observation of preschoolers in which he finds them struggles every time they are faced with a new theme or lesson and cannot be ignored. Two of the most common types of tools used to explain macroeconomics concepts are videos and apps, but a more hands on and non-conventional approach is needed to further strengthening their understanding on these concepts. Magnet paper has been widely used in advertisement and as souvenirs, but its usage in higher level education is still at an infancy stage, probably due to perception that it deems childish and only suitable for younger age such as learning ABC. However, with the right approach, this material can be the solution for the lecturers who needed a learning tool as an alternative to the aforementioned approach. The said product is the cutout of magnet paper which represent various sectors in economy and different direction of circular flows and aptly named *Magnetonomics*. After lecturer explanation, students are tasked to position the vectors which represent various economics sectors and placing the right circular flow direction to show its complex connectivity between these sectors on the magnetic whiteboard or the magnetic sheet provided. The interaction between students and lecturers while doing this activity would help them better to

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understand the concept in a quick and meaningful way. In addition, this activity also can increase the level of student imagination and the ability to memorize each element in the circular flow of economy.

2. Objectives Of Study

i. Identifying the advantages of *Magnetonomics* in teaching and learning the economic cycle.
ii. Identifying the weaknesses of *Magnetonomics* in the teaching and learning of the economic cycle.
iii. Examining the level of student acceptance of the use of *Magnetonomics*.

3. Research Questions

This study aims to answer the following questions:

i. What are the advantages of *Magnetonomics* in teaching and learning the economic cycle?
ii. What are the weaknesses of *Magnetonomics* in teaching and learning the economic cycle?
iii. What is the level of student acceptance of the use of *Magnetonomics*?

4. Problem Statement

A quick study on the group attainment of the Course Learning Outcomes (CLO) scores throughout June 2017 until June 2020 shows that on average, students only scores 53.5% for CLO 1, 61.3% for CLO 2 and 70.2% for CLO 3. While this score surpasses the 50% threshold set by the department, it still holds the sight of discontentment and requires further improvement in terms of lecturers approach in passing the key macroeconomics concepts to the students. Therefore, a simple and innovative approach called *Magnetonomics* was developed to help the students to learn the key economic concept in a fun and engaging way. The material itself is flexible and can be designed in various forms. Not to mention it is also portable, long lasting and does not cost a fortune to produce.

5. Literature Review

Various studies have been carried out to measure the effectiveness of visual learning as tool in education. Zakiul Human [2] reiterated that by using teaching aids materials (ABM) all forms of symbols and abstract verbal communication can be explained. This makes it easier for students to understand the content of a lesson. The correct and various use of teaching media can also help to overcome passive attitudes among students since it will attract students' interest in learning, increase student interaction and understanding of the reality of the teaching and learning environment which is more interesting and enjoyable. This is further explained by Faridah Shariyah [3], that says in the context of education, creativity and innovation work must come together to ensure that both processes are carried out in Teaching and Learning (TNL). The current of change and development of education in our country is rapidly growing that complicated the process of educating students. Therefore, the main objective of education today is to mold graduates who are able to deal with the rapid development changes. In order to achieve that vision, the methods and approaches of the TNL process must be designed and implemented to develop students' potential, mind builders, creative and innovative thinking. Other method is also applicable such as what Saifullah Kamaruddin [4] explains in his cooperative learning as a method that allows students to collaborate and interact in small groups. The purpose of his study is to identify the effectiveness of Jigsaw and Game model learning on third year students in terms of social skills in the hadith course. Rozana Abdul Rahim [5] said a carefully planned approach with "hands on" experience and mentions the need to help students develop numeracy skills before writing numbers. Her study uses innovative materials in teaching and learning "My Q-bab" which is effective in helping to improve the skills of understanding the concept of patterns among pre-school students. Sharapova Gulshan Sharafovna [6] said that visual aids are tools that help to make an issue or lesson clearer or easier to understand and know (pictures, models, charts, maps, videos slides, real object etc.).

6. Research Methodology

This study is a survey of the use of *Magnetonomic* among students of the Commerce Department who enrolled in Macroeconomics course at Politeknik Sultan Azlan Shah.

7. Population and Sample Study

The population are those who enrolled in Macroeconomics course for session 2: 2021/2022 at the Politeknik Sultan Azlan Shah. A number of 46 students from two different program were selected as sample. All data was analyzed using SPSS 22.0 software (Statistical Package for Social Science.

8. Research Item Questions

This study is a quantitative study and the questionnaire was distributed to the students of Politeknik Sultan Azlan Shah. The distributed questionnaire is divided into two parts. Part A contains questions related to personal profile covering demographic information such as gender, and program while Part B contains 5 questions that require respondents to answer questions according to a four-choice Likert scale. Part B contains 5 items related to the use of Magnetonomics in learning process. Respondents are required to mark '/' statements based on the rate of agreement.

9. Research Findings and Analysis

Riduwan (2012) places the level of lack of connection, low, medium and high based on the four Likert scale used. In this

study, the researcher put it into 4 levels, which are less relevant, low, medium and high as was done by the previous researcher Riduwan [7]. The mean analysis obtained will be based on the Descriptive Statistical Interpretation Table (Mean) and according to the average mean score which is a guide for the results of the study. The determination of the level is based on the mean score value as shown in Table 1.

Table 1: Determination Level Table

Mean Score Range	Interpretation of Measured Level	Effectiveness
1.00-1.50	Disagree	Not relevant
1.51-2.50	Slightly Disagree	Low
2.51-3.50	Agree	Medium
3.51-4.00	Very agree	High

Riduwan [7]

The questions of this section were analyzed by frequency, percentage. The profile of respondents in Table 2 shows that 43.5% are male and 56.5% are female. Students consist of Accountancy Diploma students (45.7%) and Retail Management Diploma program students (54.3%).

Table 2: Respondent Profile

Demography Factor	Item	Total	Frequency (%)
Gender	Male	20	43.5
	Female	26	56.5
Program	Diploma in Accountancy	21	45.7
	Diploma in Retail Management	25	54.3

Table 3 shows the overall mean score for video aids is 3.3 at a moderate level. The mean score for learning with the concept of easy learning is 3.29 at a moderate level, the mean score for aids that interest me is 3.2727 at a moderate level, on the other hand, aids that improve my understanding mean score of 3.2273, aids that are used in accordance with learning, a mean score of 3.3409 and aids that are used help my learning session mean score 3.3636.

Table 3: Mean and standard deviation for video effectiveness

Number	Item	Mean	SP
1	Learning with the concept of easy learning	3.29	0.55
2	Learning aid used interest me	3.27	0.55
3	The learning aids improve my understanding in learning.	3.22	0.50
4	Learning aid used is suitable for learning.	3.34	0.50
5	Learning aid used help my learning sessions.	3.36	0.50
	Overall mean	**3.3**	

Table 4 shows the overall mean score for Magnetonomics is 3.5435 at a moderate level. The mean score for learning with the concept of easy learning is 3.5435 at a medium level, the mean score for aids that interest me is 3.5652 at a medium level, on the other hand, the aids that improve my understanding mean score of 3.4783, the aids that are used are suitable for learning, the mean score is 3.5652 and the aids that are used help my learning session mean score 3.5652.

Table 4: Mean and standard deviation of using *Magnetonomics* as learning tool.

Number	Item	Mean	SP
1	Learning with the concept of easy learning	3.54	0.55
2	Learning aid used interest me	3.56	0.55
3	The learning aids improve my understanding in learning.	3.48	0.50
4	Learning aid used is suitable for learning.	3.56	0.50
5	Learning aid used help my learning sessions.	3.56	0.50
	Overall mean	**3.5**	

9. Conclusion

Based on the study conducted, the effectiveness of using video reached a mean score of 3.3 at a moderate level. This is because the data obtained show that almost the entire mean score is at a moderate level of 3.29-3.3 points.

On the other hand, the overall mean score for the use of Magnetonomic as a learning tool is 3.54 which can be intepreted as high effectiveness [7]. It mostly scores 3.5 and above which can be translated as having higher effectiveness as compared to the use of videos as aleraning aid. This further shows that Sultan Azlan Shah Polytechnic students finds that *Magnetonomics* is a better and help them to understand economics concept better.

Based on the result, it can be concluded that the respondents in overall agree that *Magnetonomics* is more effective tool in conveying the macroeconomics concept than the convensional use of video or lecture. The literature reviews also supported this finding by reiterating the effectiveness of hands on material is more effective as it will gain the student attention and help them to retain the information longer. Recommendations for future research, the study can focus on the impact of the use of *Magnetonomics.* Whether this activity can improve student learning outcomes with data or results collected from continuous assessment or final year examination.

9. References

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