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# The Impact of Web 2.0 Tools on Economics Education

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### ABSTRACT

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Economics education has been overly paired with traditional "chalk and talk" teaching methods. However, educators must shift the conventional teaching approach to more innovative teaching methods that allow students to engage more effectively in the learning process. This study attempts to evaluate the impact of Web 2.0 tools on students' interaction and engagement in learning Principles of Economics course. The data on the lecturer's observation, together with the engagement and expectations of forty-four students in the Principles of Economic class were used in this study. This study adopted Gibbs Reflective Model in gathering and analyzing the data. The findings indicate that the application of Web 2.0 has increased the students' engagement and performance in learning Principle of Economics and making teaching and learning more effective and interesting compared to traditional teaching method. The results imply that current Web 2.0 tools can be successfully integrated into Economics education.

## 1. Introduction

Economics is a social science study that examines how humans manage limited resources to fulfill the unlimited human needs [2]. Principles of Economics is the core subject offered by the Department of Economics in the School of Economics Finance & Banking for undergraduate students at the Northern University of Malaysia (UUM). As this subject is a requirement for the Bachelor of Science Economics and other programs, all undergraduate students are expected to take and pass this subject. In addition to qualifying the graduation of the university, studying and mastering Economics is an important requirement in a complex world with great economic challenges. The purpose of economic education is to create responsible citizens and effective decision maker. However, low student performance has been identified since several years and it may cause by the traditional method of teaching implemented. In current situation, lecturers mostly use chalk and talk, and power point slides with very limited advanced teaching aids. Traditional teaching methods have failed to capture attention of students while lesson is being taught. This is probably because there are many

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theories and concepts that need to be understood. Meanwhile, students are still bound by a school-based system that relies on lecturers to convey knowledge. In line with Education 4.0, teaching Economics in the twenty-first century requires teachers to carry out effective teaching and learning using technology, and evaluation strategies not only to achieve critical outcomes, and also to provide continuous support to digital natives.

The importance of economics education far exceeds the goal of increasing the understanding of the basic principles of supply and demand as well as economic utilization. Economics can be taught by generating new knowledge with the help of exposing students to learning environments and real learning experiences. Therefore, this study will explore the effectiveness of web 2.0 tool in teaching and learning Economics in Universiti Utara Malaysia.

## **2. Literature Review**

Becker and Watts [5,7] encourage lecturers to move away from standard "chalk and talk" lecture techniques and incorporate participative learning techniques. This study focuses on interactive and participative learning technique by using new digital media or Web 2.0, which is referred as a series of Internet applications that have transformed individual users from passive consumers to active creators of web content [20]. The difference of Web 2.0 learning technique is in terms of students' interactivity. Liu and Shrum [18] proposed three elements to define interactivity in Web 2.0. Firstly, active control (users can control the media by accepting or declining information), secondly, two-way communication (online communication between the media and the users), and finally, synchronicity (the degree of synchronization between a user's input to a communication and the response received from the communication). These interactivity elements are available only in Web 2.0, and cannot be found in traditional or non-digital media. Therefore, the use of Web 2.0 in teaching and learning encourages students to be more active and involve in class activity.

## **3. Web 2.0 and Students**

Prensky [22] coined the terms "Digital Native" and "Digital Immigrant" to distinguish groups based on their knowledge and capabilities in digital technologies (e.g. internet, social networking sites). Digital Native is defined as "a group of people who grow up in the digital world and are fluent with the digital language". Technology influences their profile, especially when it comes to media selection and preferences. On the other hand, a Digital Immigrant belongs to the generation born before digital technology emerged. These people need time to learn and understand digital technology [22,23]. Therefore, it is unlikely for both generations, Digital Native and Digital Immigrant, to share similar preferences in terms of digital technologies since their capabilities and knowledge of the digital technology may be different.

Based on Prensky's definition, the digital native generation in this current study refers to Generation Y (who were born in 1980 to 1995), whose experience of the emergence of digital technology during their formative years could have possibly influenced their profile (e.g. values, characteristics, and preferences). Previous generations (e.g. Boomers) are more competent and more knowledgeable in digital technologies as compared to the Digital Immigrant generation. In contrast to the Digital Native generation, the Digital Immigrant generation needs more time to learn about digital technologies since the technologies were not available during their childhood.

Previous studies found that Gen Y have a higher preference for digital technologies (e.g. interactive media, internet) [21,4]. It could be argued that Gen Y regularly uses Web 2.0 application such as social-networking sites (SNS) as a communication medium [25] and spend more time on the

Internet rather than traditional media [8]. Additionally, Jeong and Lee [14] discovered that Gen Y have a higher preference for SNS especially in events activities. A number of studies have found that Gen Y devotes more time and have higher preferences for Web 2.0 (e.g. Internet, social-networking sites) as compared to traditional media (e.g. television, printed newspaper) [8,14,25].

In regards to this study, most of current students are pertaining to Generation Y. Hansen, Salemi and Siegfried [18] encouraged economics teachers to allow for more active learning techniques even at the expense of reduced course content. While some may argue that demands on faculty time drive this reliance on lecture based methods, Becker and Watts [6] suggest that there is evidence that current practices are "...established by convenience, custom and inertia rather than efficiency or, especially, by what represents effective teaching practices in today's undergraduate curriculum" (p. 4). It could be argued that the use of Mentimeter and Kahoot will enhance students' interaction and engagement in the Principles of Economics class.

#### **4. Web 2.0 in Learning and Teaching**

Web 2.0 refers to a series of Internet applications that have transformed individual users from passive consumers to active creators of web content [20]. The increasing popularity of Web 2.0 applications, such as YouTube, Facebook, blogs, and Wikis, constitute "a more socially connected Web in which people can contribute as much as they can consume" (Anderson, 2007, p. 4). These applications endow new meanings to the use of Internet technologies for educational purposes. It provides opportunity for lecturers to engage with students in cooperative and collaborative knowledge building and knowledge sharing [15]. It is also useful for social engagement and collaborative dialog to take place outside the classroom [26].

The use of Web 2.0 in educational purposes is necessary especially for Digital Native students. As mentioned earlier, lecturers need to find a new way to encourage more participative technique in learning rather than using "chalk and talk" technique [5,7]. Web 2.0 tools enable service learning with new possibilities of reaching a greater number of the target students and provide the members of the community with alternative means of communication [26].

Rahimi *et al.*, [24] suggested that performing the digital learning activities provides opportunities to practice lower and higher order cognitive activities. It can be argued that the growing interest across all sectors of the educational industry as means for building personal learning environments and extending the student's control over the entire learning process. Cochrane [9] found that significant technical and pedagogical support is crucial for both the lecturers' and students' integration of mobile Web 2.0. In addition, Kahoot can foster motivation and engagement, and improves classroom dynamics as the system provides students with real-time feedback of their performance, and to some extent adapt teaching activities based on students' responses to quizzes [17].

Recently, Jaafar [11] stated that technology can improve educators' instruction, teaching method, productivity and efficiency of teaching in learning Mathematics. Majority students agreed that technology is very important in learning mathematics to make them more fun, motivated, confidences and learn independently. They concluded that the usage of technology in learning mathematics can be applied in class to develop the innovation and future ready learning and education. It also enforces students to develop essential 21st-century skills.

Based on the above discussion, it is important for lecturers to understand their students and students' capabilities especially when it comes to technology in teaching and learning. Lecturers might use Web 2.0 in teaching and learning suitable with the nature of their students where majority

of them are Digital Native Generation. The use of Web 2.0 will encourage students to participate and involve in class activities and generate an interest among them especially in Economics subject.

## 5. Methodology

This study adopted Gibbs Reflection Model [12] and Lewin [16] as a methodology for this study. The model comprises of three phases; Phase 1 is Problem Identification, Phase 2 is Invention, and Phase 3 is Evaluation. Every phase involved four steps; Step 1: Plan, Step2: Action, Step 3: Observe. Figure 1 depicted the research methodology of this study. Forty-four First Semester (September 2018/2019) Principles of Economics students in UUM participated in this study.

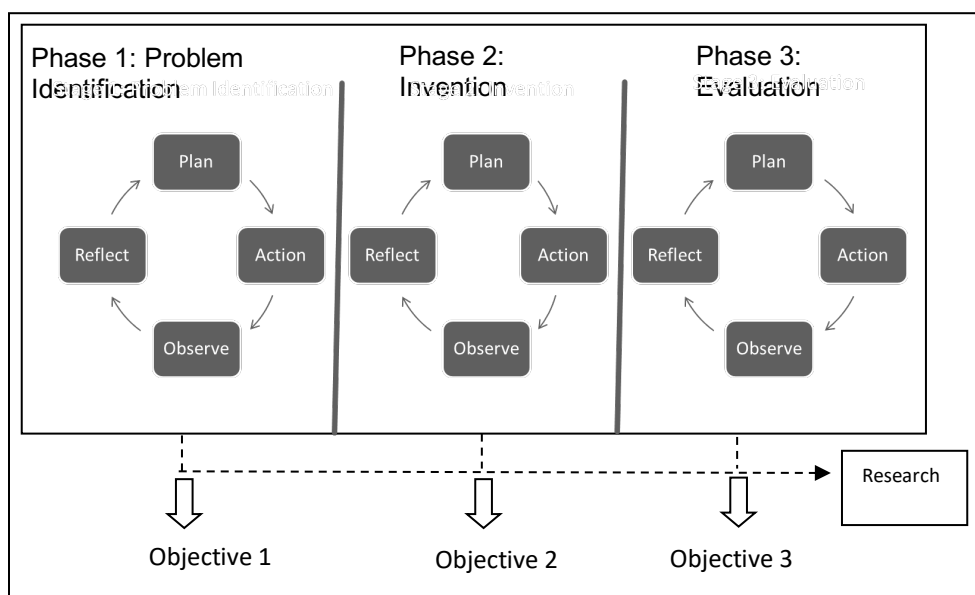


Fig. 1. Research Methodology

### 5.1 Phase 1: Problem Identification

In problem identification, previous similar works were studied. It involves the review of books, journals, proceeding, research report, and other academic related sources. Besides that, the current learning strategies are also identified to set the invention in the classroom settings. The aim of this phase is to understand the area problem, to find the gap, to identify related learning strategy' models, to review the evaluation metrics, to define problem, to identify possible solution and to form research objective. The output of this phase reflected the first objective of this study, which is to observe the nature or scenario of teaching Principles of Economics using traditional lecture. As Stated in Lewin [16], in rational social management research, four major steps proceed in a spiral of steps, each of which is composed of a circle of planning, action, and fact-finding about the result of the action. These steps are as follows: -

**Step 1: Plan.** Planning is the first and most important function of management. It is needed at every level of management. In the absence of planning, all the business activities of the organisation will become meaningless. The importance of planning has increased in view of the increasing size of organisations and their complexities. Therefore, in this research, identifying problem, research questions, scope and solution are the main important elements that need to be obtained.

**Step 2: Action.** The next period is devoted to executing the first step of the overall plan [16]. The idea is executed into action by designing the problem statement, research questions, scope and

objectives from the gap found in the literature, and in practical. In this case, one class of Principles of Economics comprising of 44 students were chosen as participants of this study.

**Step 3: Observe.** Reconnaissance or fact-finding is the third step in research problem identification. Based on the state-of-the arts study [16], reconnaissance has four functions. First, it should evaluate the action. It shows whether what has been achieved is above or below expectation. Secondly, it gives the planners a chance to learn, that is, to gather new general insight, for instance, regarding the strength and weakness of certain weapons or techniques of action. Thirdly, this fact-finding should serve as a basis for correctly planning the next step. Finally, it serves as a basis for modifying the “overall plan”. In this step, the lecturer must identify the participants based on the students’ score from previous term and own performance.

**Step 4: Reflect.** The next step is composed of a circle of planning, execution, and reconnaissance of fact-finding for the purpose of evaluating the results of the second step, for preparing the rational basis for planning the third step, and for perhaps modifying again the overall plan [16]. In this step, the lecturer makes conclusion and reflection based on the students’ score from previous term and own performance.

### *5.2 Phase 2: Invention*

The second phase is the invention, which involves the design of students’ learning strategies. In this part, the input gathered from problem identification phase will be used to construct the invention whereby Mentimeter [3], and Kahoot [19] will be integrated into students’ learning strategies. The second research is objective achieved in this phase.

**Step 1: Plan.** Based on the literature, the use of Web 2.0 and Kahoot encourage students’ participation in order to enhance students’ understanding. Mentimeter is one of the Web 2.0 application. Mentimeter is a cloud-based solution that allows the lecturer to engage and interact with the students in real-time [3] Besides that, Kahoot is a tool for using technology to administer quizzes, discussions, or surveys. It is a game-based classroom response system played by the whole class in real time [19].

**Step 2: Action.** As for the procedure, first, the lecture begins with the topic of the day. Prior to that, the class starts with explanation about the learning outcomes and outline of the topic as guidance to the topic. Then, new teaching strategies for student’s learning approach are implemented to make the process more interesting, Mentimeter questions and a short quiz using Kahoot online application were prepared. The questions contain the basic points that need to be remembered regarding the topic of the day. Mentimeter is a polling tool where lecturer can set the questions and students can give their input using a mobile phone or any other device connected to the Internet [3]. Meanwhile, Kahoot allows the students to take part in the quiz, and at the end, the student who scores the highest score will become the winner. The lecturer goes through the questions one by one and the students must answer within a given time by using their phone or computer.

There are two (2) questions in the Mentimeter and fifteen (15) questions in the Kahoot quiz. Then, the lecturer informs the students to connect with the Economics theory, and the relative elements were taught to the participants including some other points for teaching about the Economic graphs, etc. At the end of the term, the survey was conducted again with the aim to analyze and check the effect of the teaching method.

**Step 3: Observe.** Observant participants observed the specific class hour to see students’ interaction and engagement regarding the implementation of Mentimeter and Kahoot in the classroom.

**Step 4: Reflect.** The lecturer (participant) and observant participant made a conclusion and reflection based on the student's interaction and engagement during the lecture.

### 5.3 Phase 3: Evaluation

To evaluate the proposed invention, six performance metrics used are adopted from the Gibb's reflective model [10]. There are six phases of an experience or activity for writing reflection, which are Description, Feelings, Evaluation, Analysis, Conclusion and Action Plan. The survey was developed using Google document and accessed through the link <https://goo.gl/forms/dkOxBUIaM20Bjll82>. The last objective of this phase was achieved once this phase was completed.

**Step 1: Plan.** In this phase, Gibbs Reflective Model can be useful in making the researcher think through all the phases of an experience or activity. It is particularly useful for helping people learn from situations that they experience regularly.

**Step 2: Action.** There are six stages in Gibbs' model. Six multiple-choices questions have been constructed to represent all stages in Gibbs' reflective model. All evidences and supported files are collected to see the results.

**Step 3: Observe.** Students demonstrated a growing interaction and engagement towards the discussion with the lecturer. Students' feedback from the Google docs survey also shows a significance relevance.

**Step 4: Reflect.** The researcher makes conclusion and reflection based on the students' feedback on the Google docs survey.

The methodology involved the process of identifying the problem in teaching and learning Principle of Economics, finding gap, identify related learning strategy models, review the evaluation metrics, define problem, identify possible solution and form research objective. Then, using current student learning approach, namely Mentimeter and Kahoot, the invention integrated into new student's learning activities. The last aim is an evaluation phase. It shows whether the achievement is above the expectation or vice versa. Based on the evaluation form, it gives the lecturer a chance to learn, that is, to gather new general insight, for instance, regarding the strength and weakness of certain techniques of action.

## 6. Findings

This section will briefly describe the results and findings of the study. The findings of the study will be explained in steps 1, 2, 3 and 4 in the Evaluation phase.

**Step 1: Plan.** This study evaluates the finding of this study based on the Mentimeter and Kahoot result, observations on students' behavior and students' perception towards the implementation of Mentimeter and Kahoot in learning monetary policy.

**Step 2: Action.** All the findings of the students' response towards Mentimeter and Kahoot are collected as follows: -

**Mentimeter.** Two open ended questions have been inserted in the lesson on monetary policy. Figure 3 shows the sample of 44 students' responses to the first question. It showed that the students had been responded to the questions and they focus on and understand the topics taught by the lecturer. However, two students fail to give correct answers from the responses. Meanwhile, the sample of student responses to the second question are presented in Figure 4. The number of students who responded in the second question was reduced to 36 students over 44 students. This means that a total of eight students did not respond to the second question. This may be because of

they are facing problems such as running out of the phone battery or running out of data storage, or not familiar with the Mentimeter application, or may not know the answer to the question raised. However, all 36 students gave the correct answer to the second question. This finding implies only 36 students out of 44 have been actively engaged in learning activities at that moment.

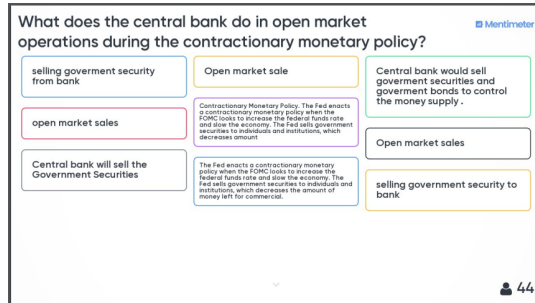


Fig. 3. Sample of Student Responses to the First Question

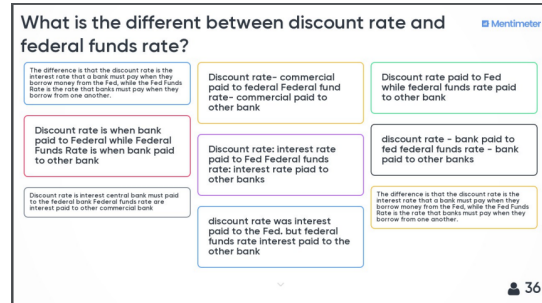


Fig. 4. Sample of Student Responses to the Second Question

**Kahoot.** Apart from the application of the Mentimeter, the lecturer has applied a game-based learning called Kahoot. Students were very excited and when the lecturer applied the game Kahoot in learning monetary policy. Kahoot enabled the students to compete in the game. Students who have successfully answered questions quickly and accurately will be the winners in this game.

The details of Kahoot are presented in Table 1. A total of 44 students were involved in Kahoot. Students were given a total of 15 questions related to monetary policy theory and application. Based on the overall performance, about 57.75% students have successfully answered the question correctly. The finding reflects that, only some of the students are able to understand monetary policy lessons in the classroom. While some of the students are unable to master the theory of monetary policy that relies on learning in the classroom only. These students need to make some revision, self-study, conduct exercises related to the monetary policy or group discussion in order to understand and master the overall monetary policy lesson.

Table 1  
 Kahoot Scores

<b>Monetary Policy</b>					
Played on	3 Dec 2018				
Hosted by	Ruhaida Saidon				
Played with	44 players				
Played	15 of 15 questions				
<b>Overall Performance</b>					
Total correct answers (%)	57.75%				
Total incorrect answers (%)	42.25%				
Average score (points)	7278.12 points				
<b>Feedback</b>					
How fun was it? (out of 5)	4.91 out of 5				
Did you learn something?	100.00% Yes	0.00% No			
Do you recommend it?	92.86% Yes	7.14% No			
How do you feel?	<input checked="" type="radio"/> 82.35% Positive	<input checked="" type="radio"/> 11.76% Neutral	<input checked="" type="radio"/> 5.88% Negative		

In addition to assessing students' understanding of monetary policy, lecturers can also find out students' feedback about Kahoot. Students have given positive feedback on Kahoot's game in monetary policy learning. Students indicate that Kahoot has increased their understanding of learning monetary policy and 93% of all students recommend that Kahoot should be applied in classroom learning. About 82.35% of all students feel positive towards this game. Meanwhile, 11.76% of them feel neutral and 5.88% of students are negative towards the application of this game on monetary policy's lesson.

### Step 3: Observe

This study was observed by two participant observants; Dr Mohamad Noor Salehuddin Sharipudin and Dr Juhaida Abu Bakar on 3 December 2018, at FE 05 in SEFB, from 2:30 – 4:00 PM. Table 2 indicated the comparison between class observations on student behavior during lectures using traditional method of teaching and during Web 2.0 (Mentimeter and Kahoot).

**Table 2**

Summary of Class Observation

Traditional teaching	Web 2.0
Students were not engaged in the class and did not reply to questions raised by the lecturer.	Students were actively engaged in the class and replied to questions raised by lecturer.
Students were not interested to learn the lesson.	Students were interested to learn the lesson and participated in the Mentimeter using their mobile phone.
Used white board to attract student's engagement, however not all students had been engaged to the lesson.	Used game-based learning (Kahoot) to attract student's engagement. Lecturer was able to ensure all students participated in the lesson by playing the game.

### Step 4: Reflect

The next step again is composed of a circle of planning, executing, and reconnaissance of fact-finding for the purpose of evaluating the results of the second step, for preparing the rational basis for planning the third step, and for perhaps modifying again the overall plan [16]. In this step, the lecturer makes conclusion and reflection based on the students' feedback on the implementation of Mentimeter and Kahoot in teaching monetary policy in Principles of Economics class.

The data from the post-test were subjected to statistical analyses to explore probable effect of the study. This section refers to students' feedback on the implementation of learning engagement using Web 2.0. Gibbs' reflective questions were adopted to obtain the feedback. The six main questions are mentioned in this section:-

**Question 1: What happened in the classroom?** This question allows respondents to describe the situation. Respondents were given the options of giving an answer, either (1) Traditional teaching & learning (T&L), or (2) Modern teaching and learning.

**Question 2: What were you thinking and feeling?** This question allows respondents to share thought and feeling during the experience. Respondents were given the option of giving an answer, either (1) Good, or (2) Bad.



**Question 3: What was good or bad about the experience?** This question is given to encourage respondents to look objectively at what approaches worked, and vice versa. Respondents were given the option to give a short answer.

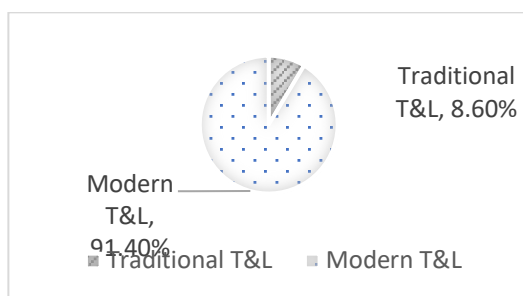
**Question 4: What sense can you make of the situation (learning engagement using Web 2.0)?** This question is given to allow respondents to give respond based on their own analysis. Respondents were given the option of giving an answer: (1) Positive, or (2) Neutral, or (3) Negative.

**Question 5: What else could you have done?** This question is given to let respondents to draw conclusion about what else happened. Respondents were given the option of giving an answer: (1) Self-learning, or (2) Group discussion, or (3) Do more exercise, or (4) Use another technology tool such as Kahoot.

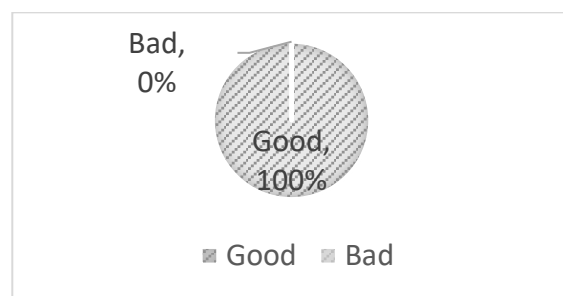
**Question 6: If it occurred again, what would you do?** This question is given to allow respondents to plan the next action. Respondents were given the option of giving an answer: (1) Self-learning, or (2) Group discussion, or (3) Do more exercise, or (4) Use another technology tool.

The findings show that 91.4% of the respondents agree that learning situation on that day is Modern T&L (see Figure 5). Only a small percentage (8.6%) said otherwise, Traditional T&L. Despite that, 100% of the respondents had good feeling with what happened in the class at that moment as shown in Figure 6. Among the students' feedback regarding the invention is mostly positive feedback. Some of the feedbacks include that they enjoy the learning method, which comprises of challenging games, the game was creative and challenging, they had good experience, the game was good because the students' brainstorm to answer the questions, they can learn anytime anywhere, the modern teaching is easier than traditional approach, the students are able to obtain example of past year questions, and others. Besides that, two negative feedbacks about the invention as stated in the survey are that students tend to answer the wrong question because of the limit time and more time is required to ensure all students are involved in the games.

As shown in Figure 7, 74.3% from total of 35 respondents show positive reaction to the using of Web 2.0 and Kahoot. However, there are 25.7% or equivalent to nine students that choose neutral. It is believed that these students did not sense the connection that using technology can increase students' engagement. Figure 8 draws the conclusion on the occurrence of the classroom. It was noted that ,45.7% of the students choose 'we experience another technology, Kahoot in the class right after we used Mentimeter'.



**Fig. 5.** Description of the situation



**Fig. 6.** Thought and feeling of the situation

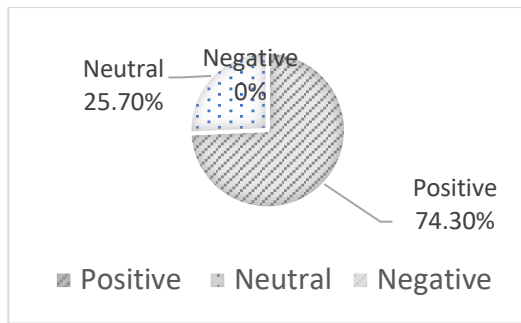


Fig. 7. Analysis of the situation

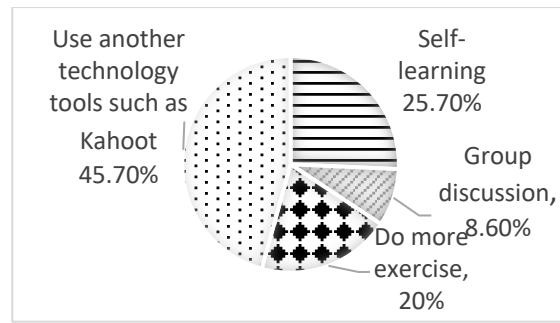


Fig. 8. Conclusion of the situation

Different students choose different answers based on their own preferences. Figure 9 shows the answer selection of each respondents about what they plan next for the course. Most of the students choose answer based on their preferences, and the graph indicates that, 54.3% choose 'Do more exercise to excel their understanding about the topics'. Basically, the use of Mentimeter and Kahoot is a form of exercise as well.

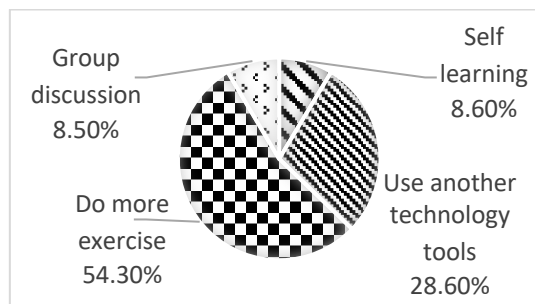


Fig. 9. Action plan of the situation

These findings are based on the observations on a group of Principles of Economics course. The topic involved in this study is on Chapter 12: Monetary Policy in Principles of Economics. Based on the lecturer's observations, Kahoot scores and students' feedback, this study found that Web 2.0's application of Mentimeter and Kahoot had increased students' interaction and engagement in learning monetary policy and making learning more interesting and effective. Therefore, Kahoot and Mentimeter were tools for interactive learning because it fosters motivation, engagement and improves classroom dynamics [17].

## 7. Discussion

The strength of this study was the success of implementing Mentimeter and Kahoot applications as one of the Web 2.0 applications in Principles of Economics class. The findings of this study are consistent with the expected outcomes of the study in which the use of Mentimeter and Kahoot applications could improve students' interaction and engagement in Principles of Economics lesson.

While the weakness of this study indicates that some students become passive learners and are reluctant to participate in Mentimeter and Kahoot. This finding signifies that the use of technology applications such as Mentimeter and Kahoot are important in teaching and learning but cannot substitute human touch, which is important to increase student's motivation in learning especially difficult subjects such as Principles of Economics. Lecturers should be responsive to the learning difficulties faced by students and help them solve the problem. In addition, lecturers should also

provide students with moral support, guidance, motivation, and inspiration, build student morale, and establish positive thinking among students on the Principles of Economics course so that they can achieve excellent results in this course.

## 8. Conclusion

This study aims to enhance students' interaction and engagement by implementing game-based learning, namely Mentimeter and Kahoot in Principles of Economics course. The findings suggested that the use of Mentimeter and Kahoot had improved students' interaction and engagement. These tools made teaching and learning more interesting and effective compared to traditional teaching methods. This finding implies that Mentimeter and Kahoot can successfully be integrated in the teaching-learning of Economics education in UUM and other higher learning institutions.

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