ACTIVE LEARNING: OUR FLIPPED EXPERIENCE

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ABSTRACT

The impact of internet revolution 4.0 (IR4.0) has also given a big impact on the institution of higher learning (IHL). Teaching and learning approach has been revolutionized towards education 4.0, where face-to-face learning were combined with an online approached. This paper examines the active learning in Electric Circuit 2 course which apply flipped classroom methods. The students were divided into five classes; three classes were conducted using conventional methods while the other two applies flipped learning. The performance of the students is then being analyze and it shows that by flipping the classroom has given a significant impact on the outcomes.

Keywords: *active learning, flipped learning, outcomes.*

1. INTRODUCTION

In recent days, teaching and learning in higher education has moved towards a hybrid approach of learning that combines traditional face-to-face technique with technology-powered e-learning method. Researches have agreed on the effectiveness of active learning approach as it combines the best approach of both worlds agreeing that cost effective, time-saving and more customized methods of knowledge acquisition. Digital learning environments are not neutral but comprises assumptions and values regarding how teaching and learning should be carried out.

The impact of web development towards higher education has been thoroughly discussed in Gregory (2013), Salmon (2014), Buus (2015, 2018), Hansen (2018), and Salmon (2015), has been illustrates in Figure 1. According to the author, Education 1.0 is principally a one-way process, where the process is still educator-centred and students are engage in activities based around provided resources. As students' global mobility enhanced over time, the role of the lecturer became increasingly important. Learning Management Systems (LMS) was introduced in Education 1.5. Educators began to integrate the conventional approach with the Web, which contemplated the knowledge of teaching paradigm. The digital part of LMSs is called active learning. Education 2.0 commences when people can generate content and communicate virtually with each other through web applications, which then embedded in LMS to enhance conventional approaches. Various teaching and learning approach grows cordially with the

availability of web resources and contributed content enabled. Cross-boundaries educational characterizes Education 3.0, where the students themselves act as creators of the contents. The contents shared, and society benefits from the knowledge sharing.
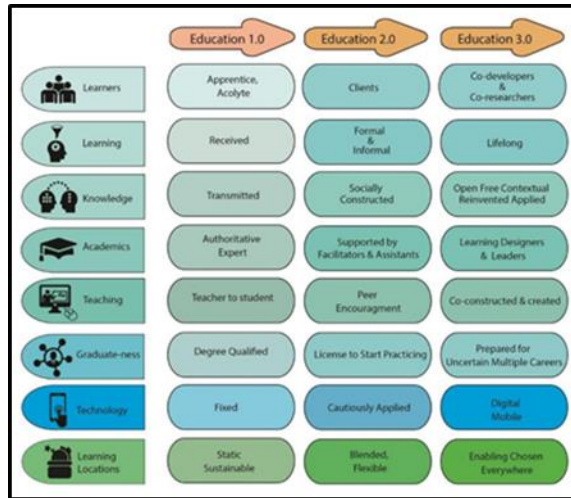

Figure 1: Higher Education 1.0 to 3.0 [1]

'Flipped Classroom' is a great example of Education 2.0. By this, information spread out of the class in an instant. Students regularly access and work on their own pace. Knowledge assimilation and peer work happens during allocated lecture time. Advancements of mobile technologies and better network infrastructures, flipping has pulled in a considerable measure of interest and experimentation.

As teaching is moving to an active learning approach where face-to-face sessions are kept for students to actively do things with peers. It must be note that the students today were brought up with smartphones and internet, and are fully immersed in "online learning". Approaches that elude "online learning" are backward because the rest of the world is moving on whilst you stand still and watch the world go by as discussed in Gillet_Swan (2017), Brooks (2016), Salmon (2015), Mutalip (2009), Flavin (2016), Flavin (2017) and Zaiton (2011).

2.   METHODOLOGY

This case study was carried out on the Electric Circuit 2 course, to oversee the effectiveness of applying new teaching approach to engineering course. This course consists of theoretical and calculation elements.

2.1   Research Methods

In this case study, 180 students undertook this course and they were divided into five classes. Three classes were conducted using conventional approached (control classes), while the other 2 classes (experimental environment classes) were exposed to active learning.   In the active classes, flipped learning was introduced to 45.6% students. Students were asked to watched online video lectures and given reading materials to gain necessary knowledge and were encourage to explore the concept of each lecture topics before the class. In class, students were guided to practise applying key concepts of the

topics through interactive activities (discussion and problems solving activities) to deepen the key concept. Presentation, quizzes and online discussions were done after each session to evaluate students understanding. The study examines the overall students' achievement who were taught in flipped classroom and conventional teaching approach.

3.   RESULT AND DISCUSSION

3.1   Research Methods

The student preferences after experiencing the process were evaluated as one of the criteria identified based on the basic attributes regarding the course. There are four Likert scale questions asked in the survey, and the findings as illustrated in Figure 2.
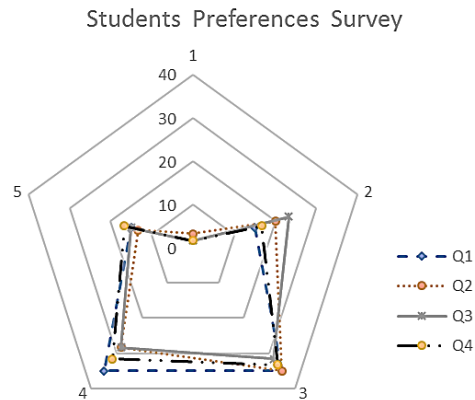

Figure 2: Students preferences survey analysis.

Questions 1 and 2 (Q1, Q2) in this questionnaire were regarding student's satisfaction on flipped approach and whether this approach suits their learning styles. Students who answered 3 and above were considered as agrees with the criteria. 85% satisfied on this approached and 76.66% agreed that this approach suits their learning styles. 75% confirmed that flipped is relevant to their learning styles in Question 3 (Q3). When the effectiveness of flipped approach in the course were examines, 81.67% suggested that it is the best methods to be implemented compared to conventional teaching and learning approach.

In the second part of the questionnaire, four criterions based on (1) students understanding on the topics, (2) improvement on communication with peers, (3) instruction from lecturer, and (4) time they spend for the subject. The outcomes as illustrates in Figure 3 to Figure 5, where majority of them agrees with the advantages of applying flipped learning on the course. The downfall of this approach is that most of them agreed that they spend more time on the subject, as in Figure 6. But they are happy that the video lecture on selected topic could be replay at anytime, anywhere possible.
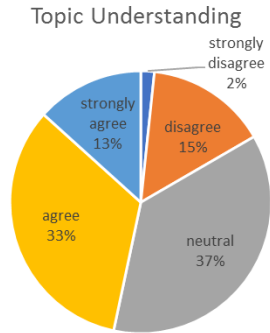
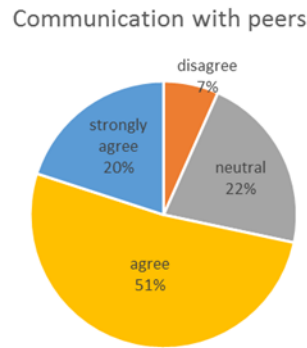Topic Understanding

Figure 3: Students perception on topic understanding.

Communication with peers

Figure 4: Students perception on communication with peers.

Instruction from lecturer
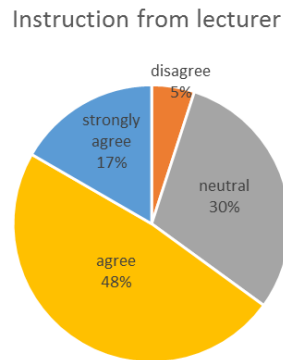
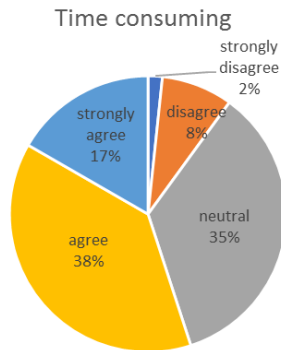**Figure 5: Students perception on lecturer instruction.**

Time consuming

Figure 6: Students perception on time consumption.

3.2 Student's Performance

In general, Figure 7 illustrates students' general achievement for this course. 87.8% have passed the course except for 22 students, and 10.6% were classified as an excellent achiever.
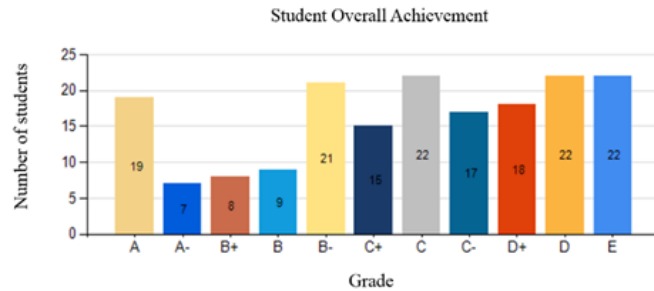

Figure 7: Overall students' achievement.

Achievements of students who were exposed to flipped and non-flipped classroom are as in Figure 8. 84.2% scored A were from flipped classroom. And only 18.2% of flipped students fail the course.
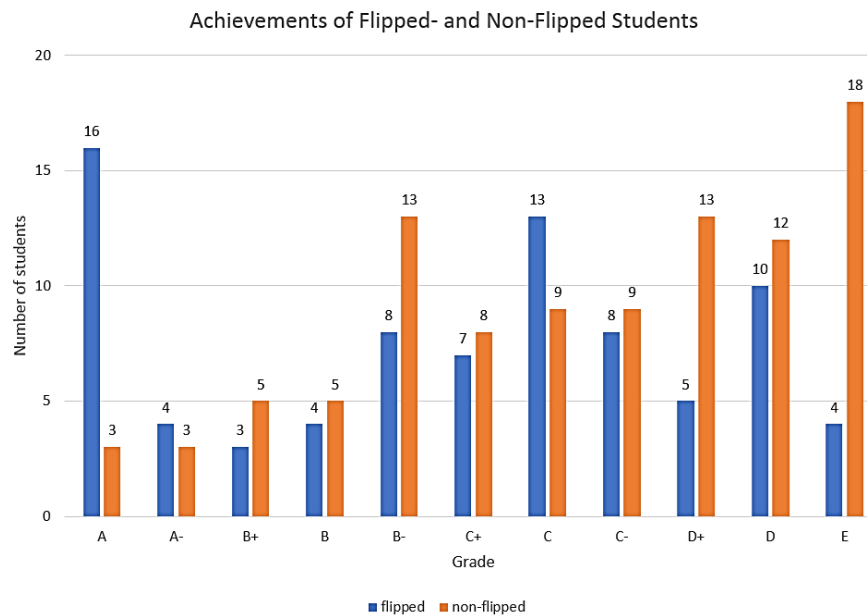

Figure 8: Students achievements based on flipped- and non-flipped classroom.

The results suggest that the implementation of innovative active learning strategies seem to have positive influences on students' achievements, while conventional approach does not give any positive impact on student performance.

The findings support the research hypothesis: "The educational achievement of the students who are taught with the active method is higher than that of the students who are taught with the conventional approach". These findings are well-matched with the conclusions of some other researches by Flavin (2017), Zaiton (2011), hirani Bidabadi (2016) and Damodharan (1999).

4. CHALLENGES

There are few challenges in applying flipped classroom although the student is well-versed with the technology. The first thing is how to engage the student with an engaged lecturer. Lecturer need to be able to actively encourage and "pull" students upward. They are responsible for their own learning but they often fall off track and need encouragement to continue.

Some students claimed that these methods fail to teach them. Student feels that the discussion information and analysis done in classroom are valuable to them.

5. RESULT AND DISCUSSION

In this study, new pedagogical techniques have been implemented in the specific course. The objectives of flipped the classroom is to move students towards active learning where students were involved in collaborative activity, problem-based learning and peer learning. Inside this specific circumstance, the lecturer roles were shifts towards coaching and facilitating the students by empowering them to take control of their own learning.

The survey and student result shows that there is significant impact on the student performance. This study proves the effectiveness of implementing active teaching and learning approach based on students' survey and students' overall attainments. Although the student performance is not solely depending on the lecturer teaching method but also depend on the student ability and attitude towards the subject matter. Thus, the outcomes confirmed the pedagogical research hypothesis: "The educational achievement of the students who are taught with the active method is higher than that of the students who are taught with the traditional method".

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