An Online Story of Electronics 1 (ELE232) Utilizing MOOC

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Abstract: An online platform for Electronics 1 (ELE232) course in UiTM Terengganu which contains fundamental knowledge of circuit theory is proposed. This platform is to introduce an online learning approach, to develop online assessments and to improve student's skills plus their comprehensive ability onto topics related; a) theoretically; semiconductor material, b) practically; diode applications (i.e: calculation), and c) both theoretically and practically; BJTs and FETs. These are the main objectives in applying Massive Open Online Courses (MOOC) into the learning course. With android and IOS system, MOOC's technology helps teachers and learners in being responsive anytime and anywhere by sharing lessons' videos, perform circuit activities and more along with some cool awesome features. The interactive and intriguing materials integrated in MOOC for ELE232 resulting in better understanding of the principle of electronics among students.

Keywords: Electronic, Online learning, MOOC

1. Introduction

Online learning environment allows learners to not only develop skills and extend their knowledge anywhere across the globe but also needed to break the boredom line of traditional 14-weeks lecture. MOOC offers open access and unlimited course to enroll with millions of resources collection. As MOOC is generally free to access, this indicates a great potential in increasing the ability of students to understand more thus perform better especially those taking ELE232 course in Faculty of Electrical Engineering, UiTM Terengganu. OpenLearning.com platform have been chosen to deliver the online learning activities without affecting the three hours lecture and one-hour tutorial per week sessions.

Over the years, majority of the students struggled in transferring their basic knowledge of circuit theory into practice. This course consists almost 80% of calculation part that mostly apply both Kirchhoff Voltage and Current Laws. Unfortunately, 14 weeks of lecture provides a very limited time to commit, plus the content is heavy thus affects students' grades as well as the percentage of student failure rate in final examination. This yearly rate percentage exceeds more than 25% and hardly less than 10%. The first chapter of this course is a theoretical part where students usually focus on memorizing the content. The next three chapters applied more than ten different methods of analyzing in order to solve diodes, BJT's and FET's transistors math problem. Both lecturer and students undeniably struggling in order to complete the heavy content syllabus thus resulting in a distressed lecturer and frustrated students. The limitation of in-the-classroom learning mode is obviously affecting the students' performances for two academic sessions (2017&2018) as shown in Figure 1. It depicts that the percentage of students whom failed the course is more than 25%. In addition, figure 2 exhibits only few students scored good result (A+, A and A-) while majority of students only manage to get satisfactory grades which lead to a high failure rate percentage (> 25%). Hence, MOOC good review and proven performance is ought

to help in reducing the percentage of these rates via implementing it as the 'other' learning mode which is execute inside the course thus increasing the student's comprehensive ability and performance.

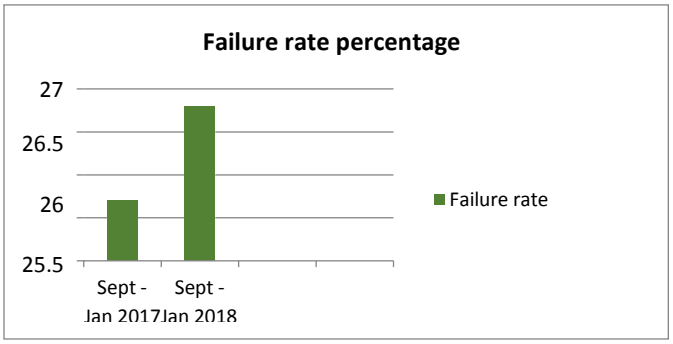


Figure 1: ELE232 failure rate percentage in 2017 & 2018

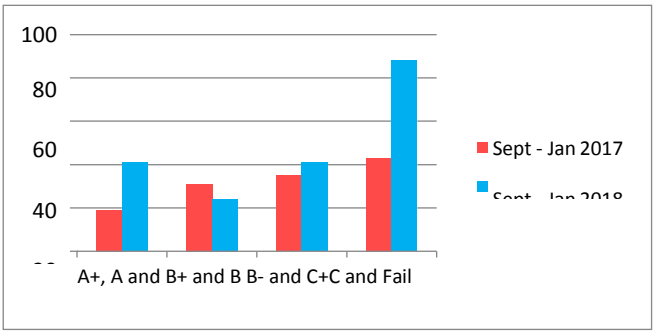


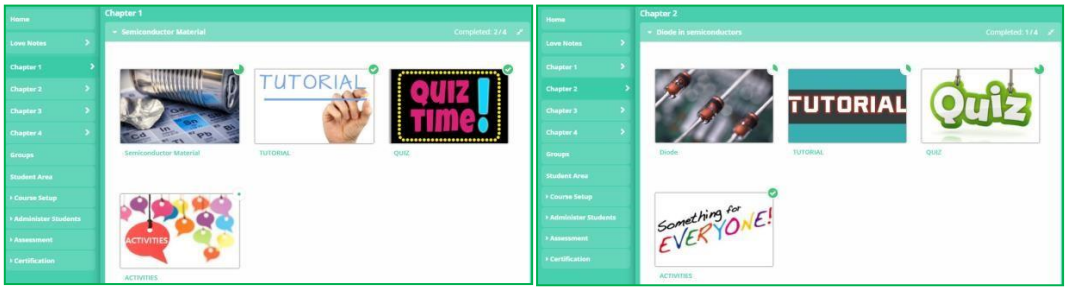
Figure 2: Students grade for ELE232 in 2017 & 2018

2. Methodology

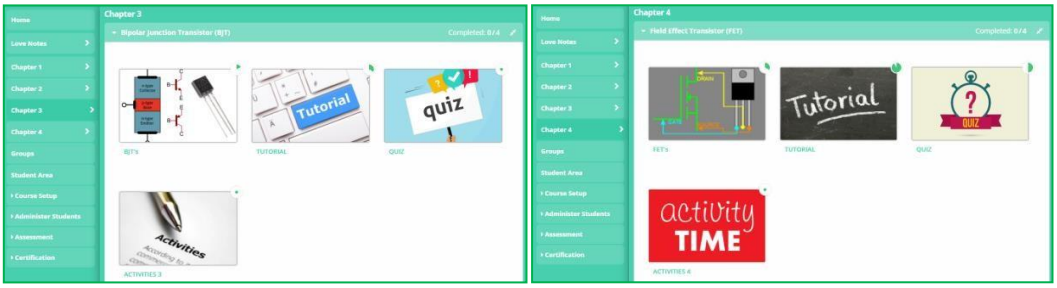
OpenLearning.com was chosen as the only online medium to deliver MOOC for this course. The platform offers free access and provides almost anything in terms of skills and inspirations, more than people can imagine. It is a good first step in exposing students to an online learning system and let them explore beyond imagination. Students can get engage with the course as frequent as they want and be active with no limited time. This platform could possibly create a community of keen learners that is seeking for a better productivity; a motivation that shall lead to an excellent performance in the final examination. Inside OpenLearning.com, the course itself is titled 'Electronics 1'. It is 85% complete and will be available to access very soon. Student that would like to join the course need to first register into this online platform. The landing page for 'Electronics 1' is shown in Figure 3.

Figure 3: Landing page for 'Electronics 1' in OpenLearning.com

Once students join the course, the homepage will exhibit the course description, course content and the duration to complete the course. Students are expected to accomplish all modules in 10 weeks. A short introduction video was also provided to give an overview of Electronics 1. At the left-hand side of the menu is the navigation for each chapter consist of semiconductor material (Chapter 1), diode applications (Chapter 2), BJT transistor (Chapter 3) and FET transistor (Chapter 4). Inside the menu, there are notes in pdf form, tutorial questions, quizzes and activities, as shown in Figure 4. Students can track their learning progress from a tracking bar that can be found at the top corner of the page. While OpenLearning.com is more likely a learning mode based on independent study, the learning activities in this course are a two-way online communication that allows lecturer and students to interact with each other. Apart from using an online platform to deliver the content of this course, the main objectives will always be the course outcome. At the end of the course, students are expected to explain the basic solid-state concepts of electronic devices and analyze the parameters of single stage transistor amplifiers in DC (direct current) and AC (alternating current) domains and diodes in different application.



(a)



(b)

Figure 4: The navigation for; (a) Chapter 1 and 2, (b) Chapter 3 and 4

3. Result and Discussion

In each of the chapter menu, a single click will open a page that contains navigation as shown in Figure 5. The notes menu comprises of lecture notes in pdf form, videos that related to each topics and also pictures to provide a better understanding. As for tutorial, quizzes and activities menu, there are sort of questions consisting of multiple choice, true/false and also activities such as Kahoot games as well as circuit simulations using PROTEUS or MultiSIM. Semiconductor material in chapter 1 consists of 100% memorizing content (theory) while the next three chapters applied mathematical practices. As memorization is quite stressful for any human soul, this will affects the performance of students' assessment especially in Test 1. Realizing students' weakness on theoretical part and the time constraint for the calculation part, this online platform is hoping to lesser the heavy responsibility of lecturers thus provides a better solution for Electronics 1 students' low performance and poor understanding.

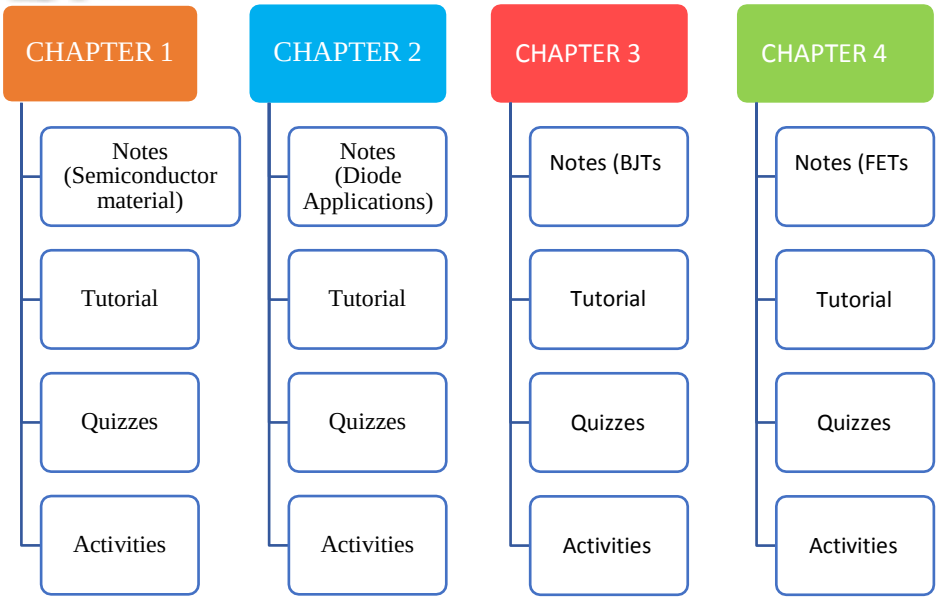


Figure 5: Navigation for the menu

4. Conclusion

All modules are currently under development and shall be completed soon. Hence, the course will be officially online to enroll students for the next September 2018 academic session.

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