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Engaging Calculus Module Site to Enhance Student Learning

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Highlights: Interactive e-learning module sites have emerged as a common pedagogic platform to enhance student learning in the contemporary classroom. Therefore it has become crucial to develop an engaging module site. This study explores a few strategies and methods adopted in developing an interactive module site. It is basically created based on the theme “Keep simple yet informative and easy to navigate”. Various existing E-learning tools such as online quiz, assignment, file sharing are used along with external applications such as Doceri, Remind, Kahoot, Wolfram Alpha which embedded within the module site. Hence, it becomes as a one-stop site for the student to effectively learn and practice Calculus either inside or outside the classroom.

Key words: Module Site, Doceri, Remind, Wolfram, Student Learning, Technology.

Introduction

E-learning module sites have become essential tools in a classroom nowadays, especially in higher learning. Paper book material sharing method is fast evolving into digital material sharing which can be used to deliver information to the students in visual and auditory form. The success of this tool is highly dependent on its potential to encourage student engagement and learning.

The objective of this presentation is to propose and share the methods for creating an engaging module site. Various applications are integrated with the module site to substitute typical document file sharing. The use of these applications enhanced the learning experience by creating mediums of constant interaction, collaboration and participation. E-learning module used technology as an instrument to set up a networked community that provided not only knowledge support but also an affinity space for deeper learning experience (Gee 2011). This research will be an insight for the lecturers for their future module site development for an effective information delivery.

Content

In order to create an engaging module site, it is first designed with a short and straightforward module description with a simple and attractive tagline before entering the module site.

In the module site, a well-structured layout is essential. The module site is categorized into five main sections. It begins with introduction tabs, follows by learning material tabs, assessments tabs, tool tabs and eventually conclusion tab.

Figure: Calculus Module Site Structure

An introduction Youtube video about Calculus is embedded at the first tab of module site to catch students’ interest about the module. Consequently, a clear and detail module information booklet file is attached at the second tab of module site. This is to ensure students can access the module information whenever is needed.
For the learning material section, it is arranged in a manner of learning-unit-by-learning-unit tabs. Each learning unit tab starts with basic learning material such as lecture notes documents and lecture videos playback and they are labelled in a subtopic by subtopic basis. Besides, it is appended with interactive learning links from Wolfram demonstration in CDF format. Finally, various external learning links with visual, audio and animation are shared under Extra Resources tab within this section. The well-guided and clear subtopics numbering lecture notes, videos and interactive wolfram demonstration are beneficial for students to view-listen-understand-think-do-practice-revise the topics. The playback lecture video, animated Wolfram demonstration and extra resources references were indeed useful for whoever is needed. The playback videos as mentioned are created by using an ipad application called Doceri. This application with video recording and uploading functions is used for the lectures’ mathematical problem solving demonstration in classroom. Every writing stroke and verbal command by lecturer are recorded with this application during each lesson and can be played back. Consequently, they can be shared as lecture videos in the learning material section. This lecture REWIND method can be done in any normal classroom without the expensive video camera recording facility and served as a cost saving solution for the institution.

The assessment section starts with homework tab, follows by a quiz and an assignment tab. Both homework and quiz are arranged in subtopic by subtopic basis as well. Clear subtopics numbering system for the homework and quiz together with the learning material (notes, video and demonstration) helps students to specifically replay, revise and practice the needed topics. This encourages them to seek help from instructor/peers and discuss among each other by referring materials from the same platform from time to time to avoid confusion and feeling lost on the subject matters. The online homework as mentioned is using an adaptive mode. Questions can be attempted and answers can be checked instantly by the students. However, adaptive mode homework also imposed penalty if wrong answer is selected during answer checking. This is meant to prohibit students from abusing the unlimited attempts of multiple choice questions homework assessment. The homework assessment with 70% threshold mark control is applied and is expected to develop students’ mathematical problem solving skill and confidence for calculus. Students tend to score higher than the threshold score. Besides, video assignment is given to the students and it creates in depth understanding and thinking on subject matter as students need to understand well before creating the video presentation.

There are a few external tools, for instance, Wolfram alpha simulator tool tab for homework and assignment assistance. Students can self-test via the simulator to clear any uncertainties arise in any topics. Kahoot classroom gaming tool tab is for learning and fun ambient. Remind messenger tool tab provides instant announcement or private messaging among instructor and students. Prompt feedback/announcement from instructor can be done via remind application. Consequently, it creates a better rapport among users. Padlet discussion board tool tab provides an open discussion platform for users about the module. Multiple quizzes, homework, assignments, learning games are carried out within the module site. Therefore students’ participation is evaluated via completed quiz, homework, game (Kahoot) & attendance (Teacherkit). Finally students’ progress and result are attached in the result tab in conclusion section.

This tech-enhanced e-learning module enriched the human interaction in a face-to-face classroom. It supported the peer-to-peer interaction and also the approachability of the lecturer since the students could ask questions and get answers beyond the time and space of a classroom. Moreover interactive technology became a medium not only to impart the technical knowledge of the calculus but also to prepare the students for collaborative tasks and problem solving. It created an affinity spaces a site of informal learning where people with different levels of knowledge, skills and experience interact based on a common endeavour (Gee 2011). This is particularly relevant given the current emphasis on learner-centred education. The e-learning module equipped the students with attributes for independent learning (Derrick et al., 2005) and developing initiative (Gibbons and Phillips, 1984) by supporting greater accessibility and adaptability, engagement and interaction, collaboration between teachers and learners.

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References

