THE CHINESE UNIVERSITY OF HONG KONG

Micro-Module Courseware Development Grant

Scheme 1: Basic Scheme

Interim Report (2015-16)

Report due 30 June 2016.
Please return by email to mmcd@cuhk.edu.hk

PART I

Project title: Interactive Micro-Modules for Students' Self-learning in Remote Sensing
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Department / Unit: Department of Geography and Resource Management
Project duration: From January 2016 to December 2016
Date report submitted: 30 June 2016

1. Project objectives

The proposed project intends to develop four interactive micro-modules for students' understanding and self-learning about the basic concepts of remote sensing. They emphasize on the process of remote sensing; the characteristics of electromagnetic radiation and its interaction with atmosphere and ground features. The micro-modules will be used as supplement to facilitate students to learn the fundamentals of remote sensing.

The contents of micro-modules will be supplemented with narration, animated graphics and videos. Instead of going through the contents in a passive way, some interactive activities are designed for students to explore. Some of these activities are in the format of short quizzes to test students' understanding of the contents and they are embedded in the learning process. The project objective remains unchanged and is right on track.

2. Progress on process, outcomes or deliverables

The production of individual micro-modules is divided into three stages. Stage 1 is the first draft. Stage 2 is fine-tuning. Stage 3 is amendment/ improvement after receiving comments and suggestions from students and teachers (only conducted if major correction is necessary).

To date of this report, the preliminary draft (stage 1) of three micro-modules are produced. They include (i) the process of remote sensing; (ii) the electromagnetic radiation; and (iii) energy interaction with atmosphere. Each of them lasts for about 20 minutes.

For the development of the micro-modules, a research assistant specialized in graphic designs was hired on part time basis. Her design skills and knowledge allows her to learn the e-Learning development software very quickly and efficiently. However, as she doesn't have any background knowledge about the subject (i.e. remote sensing) she is going to produce,

lots of effort has been spent on explaining concepts, clearing the misunderstanding and guiding development of the modules. I regard communicating with the graphic designer as a major obstacle because the academic contents are that not easy to understand given her background. It took a bit longer time than expected to familiarize with the contents before starting module building.

The project is still on schedule as three modules has already been produced. Future works include fine-tuning the presentation, design and spell check for the first three modules (stage 2) and also producing the last module. If time and resources allow, one more module will be produced which would mainly introduce satellite and sensor.

The list of outputs to date is shown in the table below. All the modules include elements of 2D visual graphics and animation presentation, narration, interactive activities. Quiz questions were designed and will be inserted to the modules in stage 2.

	Micro-module	Objective and Contents
1	The process of remote sensing	Provide an overview of what remote sensing is about. This acts as the foundation of the subsequent modules and the contents includes: ▪ Definition and Introduction ▪ Energy Interaction in the Atmosphere ▪ Energy Interaction with Earth Surface ▪ Platform and Sensor ▪ Data Transmission, Reception and Processing ▪ Interpretation and Analysis ▪ Applications and Products ▪ Summary
2	Understanding The electromagnetic (EM) spectrum	Understand the energy source of which remote sensing relies on. The contents covers ▪ Understanding our Sun ▪ Stefan-Boltzmann Law ▪ Nature of Electromagnetic Radiation ▪ The Electromagnetic Spectrum ▪ Planck's Quantum Theory ▪ Summary
3	Energy interaction with the atmosphere	Explore how atmosphere affects EM radiation transfer. Contents include ▪ Understanding Our Atmosphere ▪ Atmospheric Composition ▪ Atmospheric Interaction ▪ Atmospheric Scattering

- Atmospheric Absorption
- Summary

3. Evaluation Plan

As proposed, the evaluation will be conducted from both student and teacher perspectives. Student surveys and interviews will be conducted to collect feedbacks from the users' viewpoint. A simple questionnaire survey with both open and close end questions will be designed for this purpose. The student survey will be conducted in October 2016 after the students explore the modules.

Teachers and colleagues will be invited to experience the micro-modules to provide professional advices on content development and operational issues. The experiential survey of teachers and colleagues will be conducted in September 2016.

As the evaluation will be conducted after the completion of micro-modules development (end of August), there is no evaluation result in the meantime.

4. Dissemination Activities (reports, websites, video links, products, *etc.*)

The web link and QR code for developed micro-modules (Beta version) is shown below:

Module 1: The Process of Remote Sensing
http://www.grm.cuhk.edu.hk/~kkit/elearn/m1/story.html

Module 2: Understanding the Electromagnetic (EM) Spectrum
http://www.grm.cuhk.edu.hk/~kkit/elearn/m2/story.html

Module 3: Energy Interaction with the Atmosphere
http://www.grm.cuhk.edu.hk/~kkit/elearn/m3/story.html

The links can also be viewed using Android and Apple devices.

For android OS, search the Google Play Store for Articulate Mobile Player, or click here to open the store directly to the app.

For Apple IOS, search the app store for Articulate Mobile Player, or click here to open the store directly to the app.