THE CHINESE UNIVERSITY OF HONG KONG

Micro-Module Courseware Development Grant

Scheme 1: Basic Scheme

Interim Report (2017-18) (Additional Call)

Report due 31 August 2018.
Please return by email to mmcd@cuhk.edu.hk

PART I

Project title: 3D Plant Cell Organelles via Virtual Reality (VR) Experience

Principal supervisor: Prof. Jiang Liwen

Department / Unit: School of Life Sciences

Project duration: From March 2018 to October 2018

Date report submitted: 28 August 2018

1. Project objectives

The original project objective is 1) to construct 3D models of selected plant cell organelles based on real research data derived from our own research using the most advanced 3D Tomography TEM (transmission electron microscopy) system and the image processing, modeling and display program IMOD; 2) to develop a mobile VR application for both iOS and android operating systems which students could explore and interact with 3D plant organelles in a stimulating cell environment.

The project follows its original objectives. 3 Micro-modules have been produced by Prof. Jiang, the senior researcher of his group and technician of ITSC. The VR application is available on the iOS and android online application stores and will be put into use for teaching the course *CMBI4001 Protein Trafficking* and *LSCI5012 Advanced Topics in Biological Electron Microscopy and Live Cell Imaging* in September 2018.

2. Progress on process, outcomes or deliverables

During the first five months of the project period, three micro-modules derived from our research findings were produced by Prof. Jiang, the senior researcher of his group and the technician of ITSC collaboratively.

The list of micro-modules produced is shown below:

1. Organelles in early stage plant cell
2. Vacuoles in different stages of cell
3. ER-Autophagosome contact side

In the proposal, we planned to produce three Micro-modules in the project period. By the end of August 2018, all of the proposed micro-modules are produced and ready for use. The VR application is available on the iOS and android online application stores. In addition, we have purchased 25 VR googles for students to view the VR application in the lectures using their own mobile phones. The application and googles will be put into use for teaching the course CMBI4001 and LSCI5012 in September 2018. After all the lectures finished by early October, we will deliver the survey to students taking the courses for evaluation of the project. The project will be completed on time.

3. Evaluation Plan

We planned to perform surveys after the lectures finished in early October. Students will be questioned about the usefulness of the Micro-modules in explore and interact with 3D plant organelles derived from research data in a stimulating cell environment. Questionnaires will be developed with references to the surveys in our previous related works, and both checking and free-comment questions will be included.

Our evaluation plans have not been changed. The surveys will be disturbed to students after the lectures of CMBI4001 and LSCI5012 finishes in the early October 2018.

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

VR applications are uploaded to the following mobile online application stores:
iOS: https://itunes.apple.com/us/app/3d-plant-cell-organelles-in-vr/id1434049785
Android: https://play.google.com/store/apps/details?id=com.itsc.plantcell

We will also upload the links to the teaching website established by Prof. Jiang to further disseminate the teaching tools.