THE CHINESE UNIVERSITY OF HONG KONG

Micro-Module Courseware Development Grant

Scheme 1: Basic Scheme

Final Report (2016-17)

Report due 30 April 2018
Please return by email to The Ad hoc Committee on Planning of eLearning Infrastructure mmcd@cuhk.edu.hk

PART I

Project title: Online Interactive Chemistry eLearning Videos for First-year Students
Principal supervisor: Ying-Lung Steve Tse
Co-supervisor(s): Kin Wah Kendrew Mak and To Ngai
Department / Unit Chemistry
Project duration: From May 2017 to April 2018
Date report submitted: April 30 2018

(Our replies are in **blue**)

1. Project objectives

Is the project on track to meet its objectives? The project met its objectives to produce and evaluate 5 interactive video micro-modules, and to enhance the original 8 videos with questions. We have finished the production of all 5 videos and used some of them in two classes of 230 students in total.
Have the objectives been changed as a result of the experience of working on your MMCDG project? The objectives were not changed.
Has the project created any impact as expected? Yes, it was encouraging to see that, without mandate, 30% of the students (over 80 students) accessed the videos. This year, our data showed that students who watched our videos scored 4% higher than the students who did not.

2. Process, outcomes or deliverables

Please specify the number of micro modules produced, and the course(s) (with course codes and titles) that have used the micro modules in Part IV, and provide more detailed descriptions here. Must specify duration of each micro-modules (in terms of students online contact hours), total duration time of all deliverables and style. (With reference to the "Summary of video presentation styles" developed by CLEAR)
Has the nature of the deliverables been changed? No, the nature of the deliverables has not been changed.
Have you adjusted your timeline? No, I have not adjusted my timeline.

Overall, was the project completed satisfactorily? Yes, We completed the production of all 5 videos and enhanced the original 8 videos with questions

3. Evaluation Plan

Have you altered your evaluation plans? No, we have not.
What monitoring data did you collect? Exam averages, number of video views, user usage.
Does your evaluation indicate that you have achieved your objectives? Yes, by looking at the students' scores both in the midterm and final exams, the students who have watched these videos scored statistically higher.

4. Dissemination, diffusion and impact

Please provide examples of dissemination: website, presentations in workshops or conferences, or publications. Our micromodules and results were presented at the 2017 CUHK teaching expo.

Please provide examples of diffusion: how the project results/process/outcomes/deliverables have been used in your unit and other parts of CUHK or other institutions? We have been working with the colleagues from the Math Department and CLEAR. We plan to add more videos and include more elaborate chemistry questions.

Please provide examples of impact: how the project results (micro modules) can be adapted to other disciplines. The format of these interactive videos and available production tools and platforms can easily be adapted by other science and engineering disciplines.

PART II

Financial data

Funds available:

Funds awarded from MMCDG $ 85000

Funds secured from other sources $ _____

(please specify_____)

Total: $ 85000

Expenditure:

Item	Budget as per application	Expenditure	Balance
One part-time research assistant working about 36 hours per week for 2 months	$16,000	$16,000	0
One part-time research assistant working about 36 hours per week for 3 months	$24,000	$21,000	$3000
Computer/electronic/office hardware equipment and software purchases	$14,600	$19,599	-$4999
General expenses: purchase of storage media (USB drives, hard disks) and experimental materials. Printing posters and other printed items.	$25,000	$23,157	$1843
Fund for using ITSC Courseware/Multimedia Development Service	$5,400	$5,180	$220
Total:	$85000	$84936	$64

PART III

Lessons learnt from the project

Please describe your way forward. We would like to include more different types of questions in the videos, especially in the five newly made videos. We have already received support from a UGC grant to continue this work.

Please describe any of the following item(s) accordingly:

- *Key success factors, if any* We had short and easy-to-digest videos that are followed by questions to reinforce what they have just learned.
- *Difficulties encountered and remedial actions taken, if any.* English is not the first language of the student helpers, so it did take a while to correct the more obvious language problems and to figure out how to present scientific statements more precisely and concisely.
- *The role of other units in providing support, if any* ELITE provided recording software and hardware. KEEP provided a platform for us to post our videos and ask questions. We also paid ITSC to draw computer graphics that are used to better illustrate our points.
- *Suggestions to CUHK, if any*
  - More opportunities should be provided to more people. It also would not hurt if more financial resources can be provided in each grant.

PART IV

Information for public access

Summary information and brief write-ups of individual projects will be uploaded to a publicly accessible CUHK MMCDG website. Please extract from Part I the relevant information to facilitate the compilation of the publicly accessible website and reports.

1. Keywords

Please provide five keywords (in the order of most relevant to your project to least relevant) to describe your micro-modules/pedagogies adopted.

(Most relevant) Keyword 1: Chemistry

Keyword 2: Video

Keyword 3: Interactive

Keyword 4: Active learning

(Least relevant) Keyword 5: Standardization

2. Summary

Please provide information, if any, in the following tables, and provide the details in Part I.

Table 1: Publicly accessible online resources (if any)
(a) **Project website:** *If a publicly accessible project website has been constructed, please provide the URL.* Blackboard and KEEP
(b) **Webpage(s):** *If information of your project is summarized in a webpage (say a page in the department's or faculty's website), please provide the URL(s) here.*
(c) **Tools / Services:** *If you have used any tools or services for the project, please provide names of the tools or services in here.* Recording studio at ELITE and Video hosting by KEEP
(d) **Pedagogical Uses:** *If any flipped classroom activities have been conducted, please provide information in here. If relevant, please indicate how your project output can be used to support flipped classroom activities.*
(c) **Others (please specify):**

Table 2: Resources accessible to a target group of students (if any)

If resources (e.g. software) have been developed for a target group of students (e.g. in a course, in a department) to gain access through specific platforms (e.g. Blackboard, facebook), please specify.

Course Code/ Target Students	**Term & Year of offering**	**Approximate No. of students**	**Platform**
Eg1. DEPTXXXX	*1st term 2015*	*50*	*Blackboard*
Eg2: Dept of xxxx	*All 1st year students*	*40*	*facebook*

Table 3: Presentation (if any)	
Please classify each of the (oral/poster) presentations into one and only one of the following categories	**Number**

(a) In workshop/retreat within your unit (e.g. department, faculty)	*0*
(b) In workshop/retreat organized for CUHK teachers (e.g. CLEAR workshop, workshop organized by other CUHK units)	*0*
(c) In CUHK ExPo jointly organized by CLEAR and ITSC	*1*
(d) In any other event held in HK (e.g. UGC symposium, talks delivered to units of other institutions)	*0*
(e) In international conference	*0*
(f) Others (please specify)	*0*

Table 4: Publication (if any)	
Please classify each piece of publication into one and only one of the following categories	**Number**
(a) Project CD/DVD	*0*
(b) Project leaflet	*0*
(c) Project booklet	*0*
(d) A section/chapter in a booklet/ book distributed to a limited group of audience	*0*
(e) Conference proceeding	*0*
(f) A chapter in a book accessible internationally	*0*
(g) A paper in a referred journal	*0*
(h) Others (please specify)	*0*

3. A one-page brief write up

Please provide a one-page brief write-up of no more than 500 words and a short video.

A good science foundation is an important element to succeed in university science courses. Recently, the development of introductory chemistry courses, which play an important role in both Faculty of Science and general education, has met new challenges because of the implementation of the 4-year curriculum and the HKDSE framework. Some of our first-year students may have never chosen chemistry as a full/half subject in their HKDSE, and this vastly different secondary school education makes it an exceedingly non-trivial task for constructing foundation courses that effectively prepare our students for their subsequent classes in both the Chemistry Department and other Departments. A major goal of our videos was to lessen the gap between different students so that the learning becomes more efficient for everyone.

A major motivation to enhance the original 8 online interactive eLearning videos and to add 5 more videos for CHEM 1070 was due to the good feedbacks for the original videos in last year. Throughout this project, both ELITE and KEEP provided invaluable advice and help for recording and hosting our videos. The ELITE recording studio was instrumental for the production of the videos. On top of the existing 8 video lectures, we made five extra videos in total for some more important topics in the introductory chemistry course. Furthermore, the original 8 videos have now been enhanced to contain different questions, which are hosted on the ELITE platform. In some of the new slides, we utilized the computer graphics that were generated from the ITSC paid service. These beautifully made graphics will definitely be reused in the future.

To understand how the students used our videos, we kept track of the number of view for each video and also kept a record of the student IDs. Consistent with our expectation, the number of views was higher for what we perceived to be more difficult topics. The most popular video scored over 210 views, which is a respectable number considering that we did not require the students to use the videos. The most important statistic to evaluate the effectiveness of the videos is to compare the average scores between students with and without access to the videos. What we found was that the students who watched the videos scored about 4% higher than those without access in the midterm and final exams, respectively. This statistic is a very encouraging figure that hints at the usefulness of the eLearning materials. The class scored a 5.03 for “Course Effectiveness” in the CTE. The video access was partially, if not wholly, responsible for the success.

We plan to make even more chemistry video lectures in the future and extend this format to other more advanced classes. Furthermore, we have been collaborating with colleagues in the Math Department to try to utilize their WebWork platform that allows more elaborate questions including chemical structures. This MMCD fund has helped jumpstart this ongoing effort. We would like to use the opportunity here to express our gratitude.