

THE CHINESE UNIVERSITY OF HONG KONG

Micro-Module Courseware Development Grant

Scheme 2: Studies in Foundation Courses

Final Report (2015-16)

Report due 31 December 2016

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

PART I

Project title: Micro-modules in Mathematical Methods in Economics

Principal supervisor: YUNG Chor Wing Linda and CHOW Yan Chi Vinci

Co-supervisor(s)

Department / Unit: Economics

Project duration: From January 2016 to December 2016

Date report submitted: 30th December 2016

1. Project objectives

Is the project on track to meet its objectives?

Have the objectives been changed as a result of the experience of working on your MMCDG project?

Our objective is to help the weaker students to catch up or review the more technical part of the course and prepare them for the upper level Economics courses.

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.

Has the nature of the deliverables been changed?

Have you adjusted your timeline?

Overall, was the project completed satisfactorily?

We have produced 17 in class 360-degree view lectures, 27 set of class scribbles, 2 supplement modules and mid-term answers for ECON 1111A and ECON 1111B, in which we delivered all of them to the students via CU eLearning system and some links to Youtube before the end of the term for revision.

The nature of the course have not change dramatically but definitely saved sometime in explaining some material that we assumed most students know already, such as the extra modules on matrix operation and mid-term answer. The extra time gained was used to explain more technical part of the work. However given the material was more technical, the 360-degree view lectures in which the students can review again can be beneficial to the weaker student.

We were unable to deliver all the material right after class as we expected, especially in the first few weeks of class. We were struggling with how to video tape because the camera either over heated or ran out of battery in the middle of the class. We were able to solve both by turning it off during the break to let it cool off and use the electricity from the lectern directly instead of the battery. The lecture material used in to explain in class was also a problem because we can either get step by step using iXplain or get a final version using Drawboard PDF. In the end, both were tested and delivered. Material in class was done using Drawboard PDF where the students can use it together while viewing the videos. Extra material such as the matrix module and mid-term answers were done in iXplain. Both seem to be pretty satisfying experience for the students.

3. Evaluation Plan

Have you altered your evaluation plans?

What monitoring data did you collect?

Does your evaluation indicate that you have achieved your objectives?

Evaluation data are from CU eLearning statistics. Students do go and watch the videos, scribbles and supplement materials. Since it is only statistics, we have no idea whether the students watched the whole video or not. However, we do observe that certain lectures have a slightly more views than others. We presume that some lecturers are either more difficult or a lot of students missed that lecture. Of course it is not a perfect way of collecting the data but we can improve it later if we can find a new way of monitoring. For supplement and helping the weaker students, it should be what we expect as those who are better and attended all class tentatively should not need these supplement materials.

4. Dissemination, diffusion and impact

Please provide examples of dissemination: website, presentations in workshops or conferences, or publications.

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?

Please provide examples of impact: how the project results (micro modules) can be adapted to other disciplines.

We have attended the Teaching and Learning Innovation Expo 2016 and did a poster presentation. It seems that participants of the Expo were interested in our work especially our 360-degree view lectures.

The technology that we used can be applied to other courses. We also did a few more 360-degree view trials in our department to test our skills, such as our undergraduate poster presentation and public lectures with PowerPoint embedded.

PART II

Financial data

Funds available:

Funds awarded from MMCDG	\$ 35,744
Funds secured from other sources (please specify <u>private funding</u>)	\$ <u>536</u>
Total:	\$ <u>36,280</u>

Expenditure:

Item	Budget as per application	Expenditure	Balance
Tablet PCs and accessories	27,508	26,930	578
360-degree Video Equipment and Processing	15,600	9,350	6,250
Student Helper	1,787.5	0	1,787.5
Total:	44,895.5	36,280	8,615.5

PART III

Lessons learnt from the project

Please describe your way forward.

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

- *Key success factors, if any*
- *Difficulties encountered and remedial actions taken, if any*
- *The role of other units in providing support, if any*
- *Suggestions to CUHK, if any*
 - *Example: what should be done differently?*

We intend to continue using the technology to deliver online lectures in the near future, with the aim of expanding to more courses events.

Key success factors

- Choosing the right equipment based on experience and testing
- A well-defined workflow. The 360-degree video production process is highly technical, involving specialized equipment and software. A well-defined workflow allows the instructors and helpers to complete the process in a consistent manner.

Difficulties encountered

- Initially we struggled with video-taping because the camera either over heated or ran out of battery in the middle of the class. We were able to solve both by turning it off during the break to let it cool off and use the electricity from the lectern directly instead of the battery.

Suggestion to CUHK

- Installation of lectern spotlights. One consistent difficulty in recording lectures is the lack of lectern spotlight in many lecture theaters. When the overhead lights dim for presentation, the instructor/speaker would be a lot darker than the screen, making him difficult to videotape. We are fortunate that ELB lecture theaters have lectern spotlights installed, which essential solve the problem, but we had a lot more trouble with some newer lecture theaters such as YIA.

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.

Our project seeks to utilize the latest technology to enhance recordings of lectures. Specifically, we record videos with a 360-degree view of lectures and deliver them in formats that are compatible with virtual reality consumption. We have produced 17 in class 360-degree view lectures, 27 set of class scribbles, 2 supplement modules and mid-term answers for multiple courses, in which we delivered all of them to the students via CU eLearning system and some links to YouTube.

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: 360-Degree Video
 Keyword 2: Virtual Reality
 Keyword 3: Flipped Classroom
 Keyword 4: Lecture Recording
- (Least relevant) Keyword 5: MOOC

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)
<p>(a) Project website:</p> <p><i>If a publicly accessible project website has been constructed, please provide the URL.</i></p>
<p>(b) Webpage(s):</p> <p><i>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.</i></p> <p>https://www.youtube.com/playlist?list=PLqDPq5pbzqJKypDLTyqXc6QbHUZqN300R (Other videos were on elearn inside of YouTube)</p>
<p>(c) Tools / Services:</p> <p><i>If you have used any tools or services for the project, please provide names of the tools or services in here.</i></p> <p>Youtube</p>
<p>(d) Pedagogical Uses:</p> <p><i>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.</i></p>
<p>(c) Others (please specify):</p>

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.

<u>Course Code/ Target Students</u>	<u>Term & Year of offering</u>	<u>Approximate No. of students</u>	<u>Platform</u>
ECON 1101	1 st term 2016 & 2017	150	Blackboard Youtube
ECON 1111	2 nd term 2016	150	Blackboard Youtube

Table 3: Presentation (if any)

<i>Please classify each of the (oral/poster) presentations into one and only one of the following categories</i>	Number
(a) In workshop/retreat within your unit (e.g. department, faculty)	
(b) In workshop/retreat organized for CUHK teachers (e.g. CLEAR workshop, workshop organized by other CUHK units)	
(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)	
(e) In international conference	
(f) Others (please specify)	

Table 4: Publication (if any)

<i>Please classify each piece of publication into one and only one of the following categories</i>	Number
(a) Project CD/DVD	
(b) Project leaflet	
(c) Project booklet	
(d) A section/chapter in a booklet/ book distributed to a limited group of audience	
(e) Conference proceeding	
(f) A chapter in a book accessible internationally	
(g) A paper in a referred journal	
(h) Others (please specify)	3

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.

Our project seeks to utilize the latest technology to enhance recordings of lectures. Specifically, we record videos with a 360-degree view of lectures and deliver them in formats that are compatible with virtual reality consumption.

Most of us are very familiar with videotaping lecture and sharing them online with students. The traditional way of videotaping lecture is quite inconvenient. The biggest problem is cameras having limited field-of-view, so they can only record a tiny part of the classroom at a time. In order to capture the teacher, either someone has to man the camera, or the teacher has to stand still throughout the whole lecture. Both are very limiting.

Recently a new category of cameras have emerged, with the ability of a very wide field of view. For example, the Kodak SP360 camera we use can record a whole hemisphere, so it provides a 360-degree video of the classroom. Now a teacher can set up the camera and leave it alone, knowing that it can capture everything in the room. Similar cameras are made by Samsung, LG and Ricoh.

Besides new cameras, online video platforms have also provided new features for delivering recordings with 360-degree views. Both Youtube and Facebook support 360-degree video. When paired with a virtual-reality headset, the video will pan around with the viewer's head movement, providing an experience similar to actually sitting in the lecture.

This year, we have recorded a whole course with this method. We have also recorded several distinguished lectures, which allows many more people to experience those events than the venues could possibly accommodate.