THE CHINESE UNIVERSITY OF HONG KONG

Micro-Module Courseware Development Grant

Final Report (2015-16)

Report due 31 May 2017
Please return by email to The Ad hoc Committee on Planning of eLearning Infrastructure mmcd@cuhk.edu.hk

PART I

Project title: Examining the Effectiveness of "The Flipped Classroom" in Teacher Education Profession

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Project duration: From February 2016 to May 2017

Date report submitted: 31 May 2017

1. Project objectives

Is the project on track to meet its objectives?

Our objectives remained the same throughout the duration of the project, i.e. to provide a more interactive and student-friendly platform to assist with the understanding of the important concepts in the chosen courses.

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

The nature of the deliverables has not changed.

Due to the size and nature of the proposed project as well as the project involving many staff from various CUHK departments, there were unavoidable delays in the implementation process.

One of the primary aims of this project was to provide students with an advanced learning aide to more efficiently develop a deeper understanding of the theoretical and practical educational materials which form a central element to their learning.

Has the project created any impact as expected?

It was important for the project team that the implementation of this project would have an impact on the perceived competence of the students involved.

Our data analysis suggested that students in non-flipped classes started off with higher

perceived competence at mid-term ($p<.01$). However, students in the flipped classes showed increased in perceived competence from mid- to end-term ($p<.01$), while those in non-flipped classes remained the same. At end-term, the groups did not differ in terms of perceived competence. This data provides an early indication of the potential positive impact of flipped learning, once it is applied in the correct setting and with the appropriate frequency.

Our data analysis has revealed that by the end of the "flipped" term, students may have become more accustomed to the inverted classroom experience, and thus resulting in having similar levels of motivation and perceived competence. This is another positive indicator of the potential impact of this teaching method.

Based on our findings, it is also plausible to suggest that motivation of students using traditional methods appear to be continuously decreasing, while the flipped classroom approach is somewhat "immune" to this decrease. While research evaluating the impact of a "flipped-learning" approach is still at an embryonic stage, the potential positive impact of this teaching method has been highlighted in this project and should be explored further in future studies.

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 in here.

Corse Code	# Students	Teaching Term
PGDP5405B	60	2015-16 (T2)

Videos from YouTube were incorporated into the teaching methods to supplement the learning material during the "flipped" sessions. In addition, the course instructor designed a post-viewing quiz for students to enhance knowledge retention. The responses of the quiz were tracked and recorded online, on Blackboard, to more easily understand the level of student involvement

PGDE5311A	66	2015-16 (T2)

This module involved packaging teaching materials in a way that allows students to learn smoothly and effectively. Powerpoint slides were inserted with youtube videos for additional clarity and ease of use and understanding.. By having students study the materials prior to going to class, they became more engaged in in-class discussion, which helped to strengthen their understanding of the subject matter.

SSPE 6002/ SPED3910	30/35	2015-16 (T2)/2016-17 (T1)

In this course, the teacher incorporated a range of video clips relating to fundamental movement according to the course outline, by converting them into a more versatile and student friendly MP4 format. Instead of playing the video in class, students had the ability to watch and learn from the videos at their own pace and in a flexible location ahead of class

PEDU 6402	50	2016-17 (T1)

During this micro-module, videos were uploaded to both Blackboard and ECHO 360. Both of these platforms came with a tracking function so as to monitor students' progress and to more easily obtain usage data indicating the level of student engagement

SPED 2540	60	2016-17 (T2)

This micro-module focussed on the subject of physiology and it relies heavily on audio visual aids, producing user-friendly e-learning videos for students to access remotely and view to assist with their learning of a range of relevant terms and concepts related to exercise physiology. A range of available software was utilised to produce the micro modules, such as iMovie, Camtasia and Adobe Premier pro.

Have the research design, methodology and timeline been changed/adjusted?
Data collection for one module was delayed until the end of T2 of the 2016-17 academic year, due to the available of classes. Other than that, there were no changes to the research design, methodology and timeline

Overall, was the project completed satisfactorily?
Yes

3. Evaluation Plan

Have you altered your evaluation plans?

Does your evaluation indicate that you have achieved your objectives?

The evaluation plans have not changed in any way

Evaluation data was collected through the use of student surveys and one-one-one interviews, as planned. All data collected and analysed to date indicates that the implantation of the project has been successfully completed.

4. Dissemination, diffusion and impact

Please provide examples of dissemination: website, presentations in workshops or conferences, or publications.
Please provide examples of impact: how the research results/outcomes/findings can be extended to other disciplines.
Please describe how the research results/outcomes/findings may support the University's strategic aims in promoting eLearning.

1. Development of course materials (video editing and uploading them on Blackboard)
2. Video viewing analytics on Blackboard
3. Focus group – 5 flipped course involving 544 students
4. Questionnaires – 1,500+ questionnaires collected from 12 courses
5. Teacher interview – 5 teachers (Prof. Ha, Prof. Wong, Prof. Tse, Prof So, Dr. O'Reilly)
6. Teaching and Learning Expo 2016 (December 2016) – Poster presentation and Talk

PART II
Financial data for Project ID: 3210761

Funds available: $150,000

Funds awarded from MMCDG	$ 150,000
Funds secured from other sources (please specify_____)	$ 0
Total:	$ 150,000

Expenditure:

Item	Budget as per application	Expenditure	Balance
Research Assistant (part-time)	63,000	63,000	0
Student helpers	16,500	16,500	0
CUAV specialized service	35,000	35,000	0
ITSC Video stream hosting service	5,000	5,000	0
Learning materials	15,000	15,000	0
Miscellaneous	15,500	15,419	81
Total:	**150,000**	**149,919**	**81**

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*
  Student involvement and their embracing of the teaching method was the most common difficulty. However, a "soft" approach and a staggered implementation of micro-modules helped to overcome this barrier and eventually led to a successful project
- *The role of other units in providing support, if any*
  Numerous other units provides technical support, advice, availability of space, equipment and human resources. These units included the CUAV department, ITSC, CLEAR and ELITE. Without the constant support and availability of these various resources, it would have been impossible to complete the project
- *Suggestions to CUHK, if any*
  - *Example: what should be done differently?*
    It would be easier for teachers and course instructor if the student were made more aware of the potential benefits of flipped learning and micro-modules as an important aid to their academic learning. The proper utilization of the micro-modules will allow students to become more efficient learners, more engaged in class discussion and also assist with their longer-term retention of essential course information. In addition, and equally important, learning through a blended approach of flipped-learning can be a more enjoyable and fully-rounded experience.

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: Flipped-learning

Keyword 2: Micro-module

Keyword 3: Blended approach

Keyword 4: Autonomous motivation

(Least relevant) Keyword 5: Perceived competence

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.* N/A
(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) in here.* N/A
(c) **Tools / Services:** *If you have used any tools or services for the project, please provide names of the tools or services in here.* The CUAV & ITSC department provided advice and technical support; CLEAR provided expert advice and numerous learning seminars for course instructors; ELITE provided manpower, consultation sessions, video laboratory time and equipment. In addition, ELITE provided recording services and video editing support.
(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.* Flipped activities have been implemented as per section 2 above. These micro-modules will be available for future use across all departments within the Faculty of Education. Departmental colleagues who, to date, have not implemented any eLearning or flipped methods of teaching will welcome to use the existing materials produced from this project to implement a blended approach to teaching within their courses. In addition, the project members will be able to serve as leaders and advisors on the topic of flipped learning within their respective departments, which should lead to further developments and fine-tuning of this teaching approach in the years ahead.

Table 2: Resource 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**
PGDP 5405 A/B	2015-16 (T2) 2016-17 (T1)	60	Blackboard & YouTube
PGDE 5311A	2015-16 (T2) 2016-17 (T1)	136	PowerPoint, Blackboard & YouTube
SSPE 6002 / SPED 3910/3540	2015-16 (T2) 2016-17 (T1)	65	Online video hosting, Blackboard & YouTube
PEDU 6402 G/S	2015-16 (T3) 2016-17 (T1)	119	Blackboard and ECHO 360
SPED 2540/3630B	2016-17 (T1 & 2)	85	PowerPoint, Blackboard & YouTube

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)	1
(b) In workshop/retreat organized for CUHK teachers (e.g. CLEAR workshop, workshop organized by other CUHK units)	N/A
(c) In CUHK ExPo jointly organized by CLEAR and ITSC	2
(d) In any other event held in HK (e.g. UGC symposium, talks delivered to units of other institutions)	N/A
(e) In international conference	N/A
(f) Others (please specify)	N/A

Table 4: Publication (if any)	
Please classify each piece of publications into one and only one of the following categories	**Number**
(a) Project CD/DVD	N/A
(b) Project leaflet	N/A
(c) Project booklet	N/A
(d) A section/chapter in a booklet/ book distributed to a limited group of audience	N/A
(e) Conference proceeding	1
(f) A chapter in a book accessible internationally	N/A
(g) A paper in an referred journal	N/A
(h) Others (please specify)	N/A

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.

The main objective of this project was to align students' classroom activities and subsequent methods of assessment with designated learning outcomes, specifically identified to maximise student involvement and enhance retention and application of relevant educational material. This was achieved by highlighting the main barriers and difficulties, based on the literature and personal teaching experiences, in the development of flipped classroom and mapping out methods to address and ultimately, overcome them.

Additionally, this project assessed the quality and effectiveness of the implementation of the flipped classroom by measuring critical learning outcomes, such as the ability to problem solve, think critically and also display a distinct sense of creativity when presented with appropriate methods of assessment.

The project involved five team members in total. More than 1,500 questionnaires were collected from 544 students across 12 courses within the faculty of Education. Various methods of flipped learning approached were used to create micro-modules using tools such as PowerPoint, Blackboard & YouTube Online video hosting, and ECHO 360. Focus group and one-on-one interviews were conducted to further supplement the data collected and provide a deeper insight into the evaluation of using the flipped learning approach to enhance the student learning experience. Students' perceived competence and their motivation towards learning were key measurable within this project to assess the impact of flipped learning within the normal course curriculum. Following the analysis of the interviews with individual instructors, some common themes emerged in terms of optimizing the effectiveness of the flipped-teaching implementation. These included:

- Linking assessment to the usage of micro-modules (approximately 30% of the course mark);
- Modifying assignments to encourage engagement in the blended approach;
- Preparing questions and facilitating discussions to supplement the student involvement;
- Ensuring the implementation is student-centred, as much as possible;
- Gradually deliver the modules to the students, rather than dumping them all at once, particularly if it is their first experience of flipped-learning;
- Apply the blended approach as a method to motivate the students both intrinsically and extrinsically and provide the option for the students to view the modules in multiple languages, wherever possible;
- The mentality of the instructor should to become a facilitator, rather than a teacher;
- Limit the length of videos or animations to less than 10 mins, so that the attention of the student can be retained throughout;
- Be conscious of class size; a large class (> 50 students) may limit the effectiveness of the approach;

In terms of long-term impact, the results of the study will provide a foundation and framework to develop flipped classroom teaching materials and assessment tools. Furthermore, the results would help to identify elements of the flipped classroom that enhances students' learning experience and outcomes. Such feedback will provide evidence to support the modification or future development of corresponding teaching materials. If the approach is deemed successful, the framework developed will benefit both instructors (in designing courses and corresponding teaching materials) and students (for receiving instruction that is more conducive to their learning).