

THE CHINESE UNIVERSITY OF HONG KONG

Micro-Module Courseware Development Grant

Scheme 3: eLearning Pedagogy Research

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:

The Research Study on the Innovative Pedagogical Method for teaching of Clinical Skills in Preparation of Objective Structured Clinical Examination (OSCE): The Flipped Micro-Modules of OSCE stations

Principal supervisor: Deratments/Unit

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Project duration: From May 2017 to April 2018 (permission for the extension till 31 Aug 2018)

Date report submitted: 31 Aug 2018

1. Project objectives

As members in our term collaborate between clinical and basic science departments (pre-clinical knowledge), we can ensure that the *Flipped CExam* can be built on and deliberately courseware to the medical clerkships promoting clinical competencies for the Objective

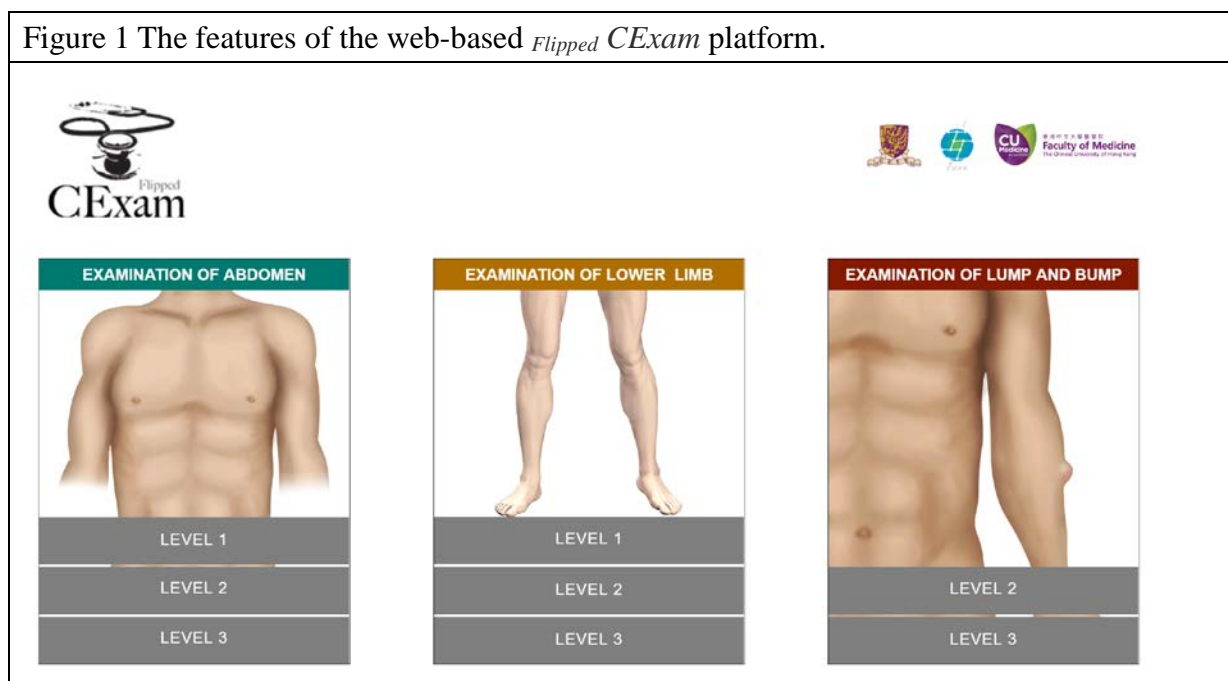
Structure Clinical Examination (OSCE) of all the clinical examinations confidently.

At the end of the project, the integration of the modern pedagogical methods, i.e. flipped classroom and micro-modules, into our e-learning platform entitled as the *FlippedCEExam* has been set up. The objectives of our study are to assess the effectiveness of the *Flipped CEExam* of the students' experiential learning, which equip students with the accurate pre-clinical knowledge and essential post-clinical counselling skills for clinical examination and consultation.

2. Process, outcomes or deliverables

In this project, the web-based *Flipped CEExam* platform has been launched in the BlackBoard; students can also access the content via the mobile device either in iOS or Android as shown in Figure 1.

Figure 1 The features of the web-based *Flipped CEExam* platform.



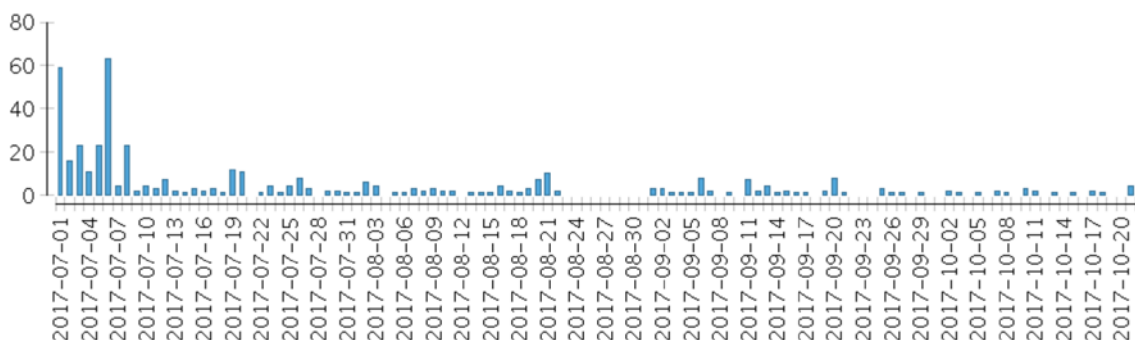
The *Flipped CEExam* may also be regarded as continuity of the learning environment fosters learner-centeredness of the medical clerkships by establishing more opportunities for connections with clinical examinations by integrating the essential knowledges of core clinical competencies. The outcomes and deliverables for three topics with three levels, including **Level 1** – preclinical knowledge, **Level 2** – clinical knowledge, and **Level 3** – clinical examination guide are listed as Table 1. Overall, we are satisfied with the project that has been completed in the end of Aug, 2018.

Table 1 The description of the different levels for the topics.

Examination Topics	The Levels
<ol style="list-style-type: none"> 1. Abdomen examination 2. Lower limb examination 3. Lumps and Bumps examination 	<ul style="list-style-type: none"> – Level 1: The clinical anatomical structures and functions and learning assessment (on-line quizzes) – Level 2: The procedure of the Clinical Examination and animations for the physical examination – Level 3: Tricks to the sit for the clinical examination

3. Evaluation Plan

We understood that the action of feedback is crucial in building up a successful novel micro-module courseware for the medical clerkship usage in medical education, our team has conducted evaluation plans. Our team has built up the Clinical Examination Guide in Abdomen Examination for Medical Year 4 upward and implemented in the Blackboard last academic year. The track record of the accession rate for the trial run as shown below. As the lectures was early July, there was a high accession rate within this period, but students are on and off to watch the Guide at the end of Oct 2017. The data has been explored that the Guide could be facilitated students to understand how the clinical run.



At the end of the project, the descriptive analysis has been performed for the trial version of the *Flipped CExam*. There were 16 participants including Medical Year 2 to Year 6 students and the health professional teachers to evaluate the usefulness of the content of the platform. The features of the *Flipped CExam* that the participants liked most has been shown in the Figure 1. We also adopted the 5-point Likert Scales to measure the psychologic attitude towards the contents of the learning material and the data was shown in Figure 2. From the interpretation and analysis, only 12.5% participants disagreed or strongly disagreed the learning material may not be useful. Besides, we also collected the comment from the participants if they have any suggestions for the improvement of the trial version as listed in Figure 3. Moreover, we will response to those comment to fine tune the platform.

Figure 1 The features of the *Flipped CExam*.

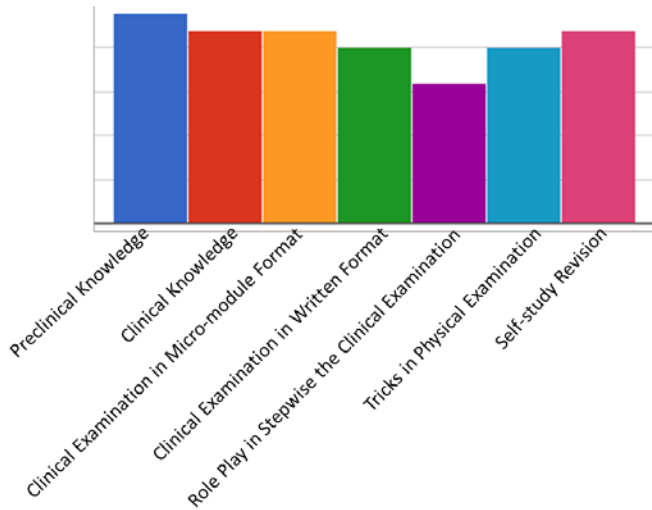


Figure 2 The percentage agreement for the usefulness of the learning material.

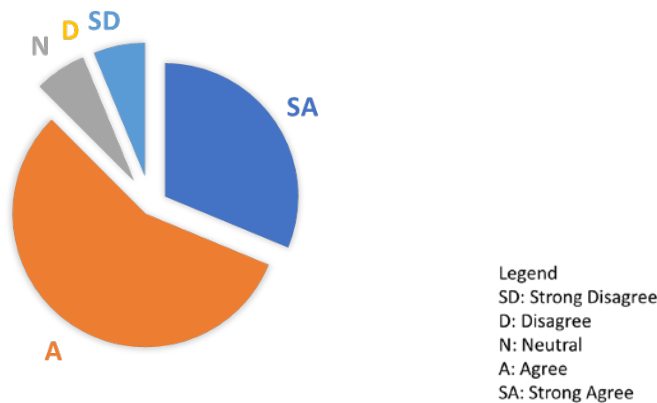


Figure 3 The comment for the improvement of the *Flipped CExam*.

- An overall flowchart of the examination process and the relative checklist for each of the parts would be extremely useful.
- Explanations for MCQs and some video demonstrations if possible
- more photos/interactive learning materials in the written formats and more demonstrations of clinical examination on patients.

In the coming academic year, we will be show the distribution of the study measures once the implementation of the *Flipped CExam* to all students enrolled in Medical Year 4. Univariate and bivariate analyses will be applied to examine the difference in examination

outcomes by courseware usage, student characteristics and perceived effectiveness of teaching outcome. Multiple regression models will be used to explore the factors associated with outcome variables of students' exam performance and perceived effectiveness of the *Flipped CExam*. More importantly, research on our objectives will be conducted and performed for exploring the strategic pedagogy of clinical clerkship training in medical education.

4. Dissemination, diffusion and impact

Our pilot study for this project has been disseminated in either the local conferences/workshop or international conference as listed:

- Teaching & Learning Innovation Expo 2017, organized by CUHK, Hong Kong on Dec 7, 2017
- The 2nd Medical Education Conference organized by CUHK, Hong Kong from 16-17 March 2018
- The Annual Conference held by An International Association for Medical Education (AMEE) in Congress Centre, Basel, Switzerland from 25th to 29th August 2018
- Summer Clinical Attachment Programme, organized by Faculty of Medicine for the secondary school students from 9 to 13 July 2018.

The *Flipped CExam* will be proposed to integrate for interactive learning during clinical teaching for the blended learning in the Faculty of Medicine. The *Flipped CExam* is:

- a good clinical skill learning tools for students to consolidate their basic clinical skills;
- a good-fit micro-module for flipped classroom medical teaching;
- a good critical procedure for preparation OSCE; and
- a good self-evaluation to relief the students' anxieties in the transitional period.

We did the showcase in Faculty of Medicine of how the blended teaching capacity can be adopted in the clerkship training. Moreover, the other health professional competence can be assessed to ensure the reliability and validity for the fulfillment of professional authenticity to uphold the healthcare system in the future.

PART II

Financial data

Funds available:

Funds awarded from MMCDG	\$ 109,270.00
Funds secured from other sources (please specify _____)	\$ <u>NIL</u>
Total:	\$ <u>109,270.00</u>

Expenditure:

As the preparation of financial statement of this project is still in progress, it will be resubmitted once finalized.

PART III

Lessons learnt from the project

In order to ensure the reliability and validity for the fulfillment of professional authenticity, the primary goal of *Flipped CExam* will be integrated for interactive learning during clinical teaching for the blended learning in the Faculty of Medicine. The clinical skills learning, and teaching is a vital part in medical education, we do not only develop an e-learning platform but also share the experiences to showcase Faculty teaching capacity. Students can map their learning process at the high-quality level of materials in this eLearning platform in the future. The betterments of the *Flipped CExam* are:

- To relief students' anxious in the transitional period. It provides clearly instructions to illustrate study guides which enhance students better understand the progress of clinical competence and promote their interest in problem-solving - in the clinical setting later on in their career.
- To develop and implement best-fit micro-modules for flipped classroom teaching. Students can acquire the on-line teaching content for activation of the blended learning and memories the significant points before examination.
- To develop clinical skills learning tools for students to consolidate their basic clinical skills. Students can have a quick review of any core knowledge in one service platform of which they can transform it into their clinical skills
- To emphasize critical procedures of OSCE. The tool is be a good compliment for them to have better understand to sit for the examination.
- To allow self-evaluation. Students can revise questions, do formative assessment or quizzes; all of which play a major role in their learning process as the scores can reflect those students' ability on their understanding of the topics.

To conclude, our team has already made a short video as shared in the link (https://gocuhk-my.sharepoint.com/:v:/g/personal/rayl_cuhk_edu_hk/EeWj_hf6lGRPu6DVA70KvBABxR2h3QXSAP0feQx1oJN6_A?e=b5H9b3) to introduce our innovative *Flipped CExam* which can be accomplished and coped with the objective in training medical clerkships in clinical examinations.

PART IV

Information for public access

The integration of the modern pedagogical methods, ie. flipped classroom and micro-modules, into our e-learning platform entitled as the *Flipped CExam* has been set up. The objectives of our study is to assess the effectiveness of the *Flipped CExam* of the students'

experiential learning, which equip students with the accurate pre-clinical knowledge and essential post-clinical counselling skills for clinical examination, eg. Objective Structural Clinical Examination (OSCE) and consultation.

The *Flipped CExam* will be proposed to integrate for interactive learning during clinical teaching for the stimulated-based blended learning as the pros of it shows that it is the:

- clinical skills learning tool for students to consolidate their basic clinical skill, especially to the feature of pre-clinical and self-evaluation.
- good best-fit micro-modules for flipped classroom medical teaching composing the clinical knowledge and clinical examination guide, which can relief students’ anxieties in the transitional period.

Regarding the medical teaching, we do not only develop an e-learning platform for the virtual stimulated based in the blended learning but also share the experiences to showcase Faculty teaching capacity.

1. Keywords

(Most relevant) Keyword 1: clerkship training

Keyword 2: OSCE

Keyword 3: blended learning

Keyword 4: clinical knowledge

(Least relevant) Keyword 5: pre-clinical knowledge

2. Summary

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>http://www.cuhk.edu.hk/culive/CExam/</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) in here.</i></p> <p>The <i>Flipped CExam</i> is only the pilot study supported by the MMCD committee for the blended learning in the Faculty of Medicine without any information in our School’s website.</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</i></p>

services in here.

Summer Clinical Attachment Programme (SCAP): To host a flipped classroom session in 1-hour for around 170 prospective S5 students of the SCAP as showed the photo below, which has be held from 9 to 13 July 2018 by Dr. Heyson Chan.

(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.

Summer Clinical Attachment Programme (SCAP)

We adopted the *Flipped CExam* for a flipped classroom session in SCAP, which has be held from 9 to 13 July 2018 by Dr. Heyson Chan. The aim of SCAP is to lead the attended ~ 170 prospective S5 student for enrichment in understanding on medical professional career pathway as showed the photo below,.



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.

<u>Course Code/ Target Students</u>	<u>Term & Year of offering</u>	<u>Approximate No. of students</u>	<u>Platform</u>
Medical Clerkship Training/medical clerkships	1 st term 2017	270	Blackboard

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)	<i>NIL</i>
(b) In workshop/retreat organized for CUHK teachers (e.g. CLEAR workshop, workshop organized by other CUHK units)	<i>NIL</i>
(c) In CUHK ExPo jointly organized by CLEAR and ITSC Poster& Oral presentation – Title: An Innovative Pedagogical e-Learning Micro-module Courseware in Preparation of Objective Structured Clinical Examination (OSCE): The Flipped Classroom in Clinical Examination Teaching & Learning Innovation Expo 2017, organized by CUHK, Dec 7, 2017	<i>1</i>
(d) In any other event held in HK (e.g. UGC symposium, talks delivered to units of other institutions) Oral Presentation - Title: Work or Not Work: The Innovative Flipped Clinical elearning Platform For Objective Structural Clinical Examination Preparation The 2nd Medical Education Conference organized by CUHK, 16-17 March 2018	<i>1</i>
(e) In international conference Poster Presentation - Title: The Innovative Flipped Clinical elearning Platform Facilitates The Objective Structural Clinical Examination Preparation The Annual Conference held by An International Association for Medical Education (AMEE) in Congress Centre, Basel, Switzerland from 25 th to 29 th August 2018	<i>1</i>
(f) Others (please specify)	<i>NIL</i>

Table 4: Publication (if any)	
<i>Please classify each piece of publications into one and only one of the following categories</i>	Number
(a) Project CD/DVD	<i>NIL</i>

(b) Project leaflet	<i>NIL</i>
(c) Project booklet	<i>NIL</i>
(d) A section/chapter in a booklet/ book distributed to a limited group of audience	<i>NIL</i>
(e) Conference proceeding The Abstract Book and Programme Book, The Annual Conference held by An International Association for Medical Education (AMEE) in Congress Centre, Basel, Switzerland from 25 th to 29 th August 2018	<i>1</i>
(f) A chapter in a book accessible internationally	<i>NIL</i>
(g) A paper in an referred journal	<i>NIL</i>
(h) Others (please specify)	<i>NIL</i>

3. A one-page brief write-up

Background

Starting from the Medical Year 4 in the Medical curriculum of Bachelor of Medicine and Bachelor of Surgery program, students are regarded as the junior clerkships who participate in the first year of the clinical practice should receive the clinical training in Surgery and Internal Medicine. The transition between preclinical and clinical training can be challenging and stressful for students as they need to apply learned knowledge and find solutions to clinical problems during the bedside trainings. While there is a restricted resource in face-to-face teaching students the proper way to take a patient's history, carry out physician examination, and counselling skills, students may not be confidently prepared for the clinical examination.

Objectives

Our team has built up web-based platform in micro-module flipped classroom for training clinical skill especially for the Objective Structural Clinical Examination (OSCE), which can be applied for interactive learning during medical teaching in the Faculty of Medicine. It also aims to equip students with the accurate pre-clinical knowledge and essential clinical skills for clinical examination and consultation.

Methods

The modern pedagogical methods – flipped classroom and micro-modules – are a combination of learning processes of e-learning activities with face-to-face periods in the classroom. It can be applied to strike a balance between the clinical skills training and clinical examination (CEXam) assessment, which can facilitate medical students to improve on their clinical competencies. The new innovative micro-modules platform, called flipped classroom micro-module CEXam (*Flipped CEXam*) platform has been created as shown in the video

(https://gocuhk-my.sharepoint.com/:v:/g/personal/rayl_cuhk_edu_hk/EeWj_hf6lGRPu6DVA70KvBA_BxR2h3QXSAP0feQx1oJN6_A?e=b5H9b3).

Results and Conclusions

The trial run of Level 3 - Clinical Examination Guide of the ‘Abdomen Examination’ in the *Flipped CExam* was made available to students starting from July 1, 2017; the high and sporadic accession rates were observed during the clerkship training. At present, all topics of the *Flipped CExam* have been constructed the users’ review in the early Aug 2018. The electronic questionnaires were conducted to explore students’ and teachers’ opinions towards the effectiveness of the *Flipped CExam*. The feedback from student users and the teachers were positive as they can have a better understanding of OSCE. Some of the comment were collected and showed in the video (https://gocuhk-my.sharepoint.com/:v:/g/personal/rayl_cuhk_edu_hk/EeWj_hf6lGRPu6DVA70KvBA_BxR2h3QXSAP0feQx1oJN6_A?e=b5H9b3).

Take Home Message

Overall, the *Flipped CExam* can facilitate students to understand how the clinical examination to be run.