

THE CHINESE UNIVERSITY OF HONG KONG

Micro-Module Courseware Development Grant

Scheme 1: Basic Scheme

Final Report (2017-18)

Report due 31 October 2018

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

PART I

Project title: A Step-Forward for Blending Learning: Mobile Micro-Module Flipped
Classroom Courseware in Clinical Year Studies

	Name	Department/Unit
Principal supervisors:	Professor Siew C Ng	Department of Medicine & Therapeutics, Institute of Digestive Disease
	Dr. Heyson CH Chan	Specialist in Gastroenterology and Hepatology, Department of Medicine and Therapeutics
	Dr. Florence MK Tang (Coordinator of the Project Team)	Division of Teaching and Learning, School of Biomedical Sciences
	Dr. Po HM Yeung	Division of Teaching and Learning, School of Biomedical Sciences
Co-supervisors:	Mr Taylor Tang	Information Technology Services Center
	Dr. Olivia MY Ngan	CUHK Center of Bioethics

Project duration: From December 2017 to October 2018

Date report submitted: 31 October 2018

1. Project objectives

Our team has ensured all the work of the development of the MMCDG to do on schedule. The project is on track to meet its objectives within budget granted. At present, medical year 4 students become the junior medical clerkships in the clinical curriculum. Besides of the adaption of the transition period for the new study environment, they are also required to sit for the Objective Structural Clinical Examinations for the day-one professional competence. With such high stress levels, they are anxiety to have the negative impact on their studies.

Now, the project aims to develop micro-modules related to diseases and conditions for training the skills of physical examination, the ability to think critically, where students acquire skills in the differential diagnosis as such logistic connection is no rules or textbook to define, quantity or teach. Consequently, our team has applied the flipped classroom format to train the clerkship in a stepwise for coping with the clinical skills, attitudes, problem-solving abilities and how to apply the knowledge for diagnosis. Students can relief their anxieties to sit for the ongoing OSCEs and understand more about the day-one competence in the professional training. Our innovative flipped courseware is helpful in preparing students in the transition while on clinical clerkships and reinforce the commitment to professional principles while they transit to their new roles as student physicians on health care teams with less anxiety level.

2. Process, outcomes or deliverables

Clinical tutors, clinical teachings and ward rotations will introduce students the art and science of practicing medicine in different fields, including internal medicine, family medicine, surgery, and gastroenterology & hepatology. Our team would like to have a pilot study to use common diseases for demonstration the components of how a critical thinking can be processed, for example, spot out the problem from the patient, collect the facts from physical examination and make the differential diagnosis from the subtraction of the probabilities. In this project, mPACS (mobile Pass A+ in Clinical Studies) of the courseware involving the topics of clinical significance of anatomy and physiology in abdominal cavity, liver cirrhosis with portal hypertension, ascites and Organomegaly due to haematological diseases. Moreover, mPACS has been build up and created four micro-modules as listed:

Micro-module 1: Clinical Skills – Bedside Physical Examination

Micro-module 2: Virtual Practice of Clinical Skill – Bedside Physical Examination

Micro-module 3: OSCE Guide: Diagnosis of Chronic Liver Disease

Micro-module 4: OSCE Guide: Clinical Significances during the Bedside Physical Examination

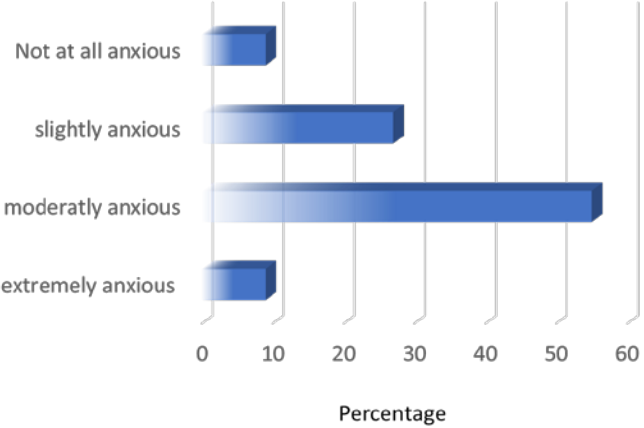
Our nature of deliverables have been still adhered to the original plan to develop the mPACS but the arrangement topics are revised. Overall, the project was completed satisfactorily. Our team will go further to have the pilot study for the publication.

3. Evaluation Plan

As the development of mPACS was completed on the early August 2018, the evaluation plan has been revised. Our team understand that the student's personal quality will affect the exam result of the Objective Structured Clinical Examination (OSCE). Project outcome has been evaluated by anonymous survey and focus group study among participants. More importantly, mPACS is the flipped classroom learning, a study of the junior clerkships' perceptions towards our mobile e-learning platform for management of the OSCE anxiety has also been surveyed.

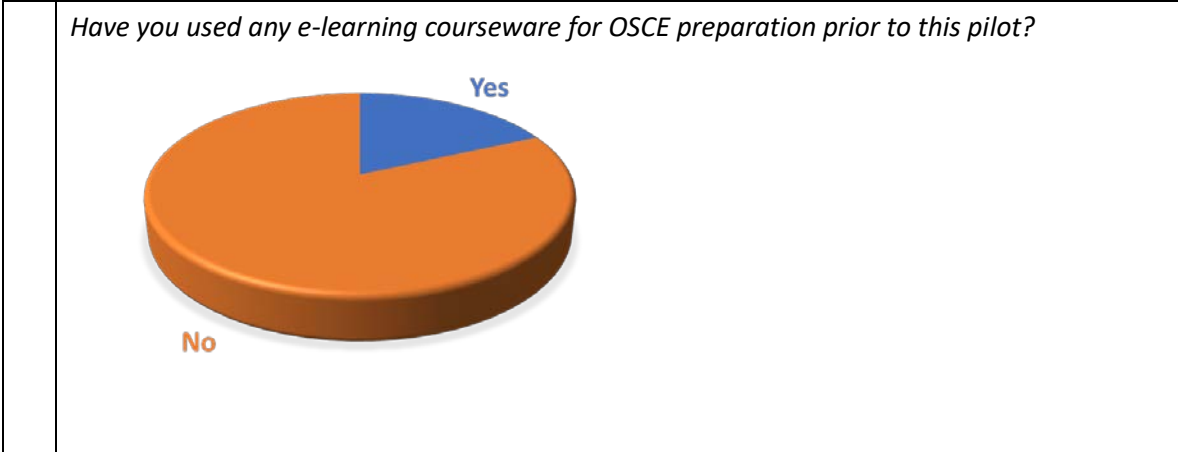
Our team has invited twelve medical year 4 students of the junior clerkships for this study. They have already attended the bridging course but without ward experience. For the study issue, the mPACE was launched in the Blackboard as the course entitled as “2018 Clerkship Training eLearning Tool (MEDU-CT)”. The study method was divided into three phases involving pre-experience Survey which has been collected the data for the expectation of the courseware, post-experience survey which has been collected the data after the participants have been studied the eLearning material of the mPACE and the overall experience survey which has been collected the data for the participants learning experience after face-to-face debriefing session.

The multiple choice of the attitude towards the learning experience, open-ending questions/comments and 5-point Likert scales were applied to all the surveys. The data of key core questions were collected and analysed as follows:

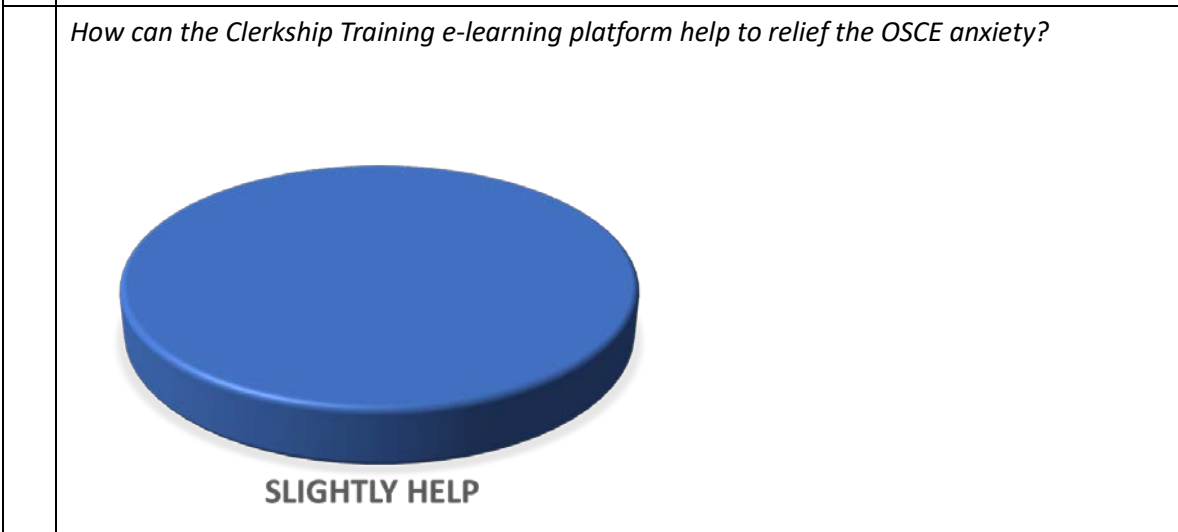
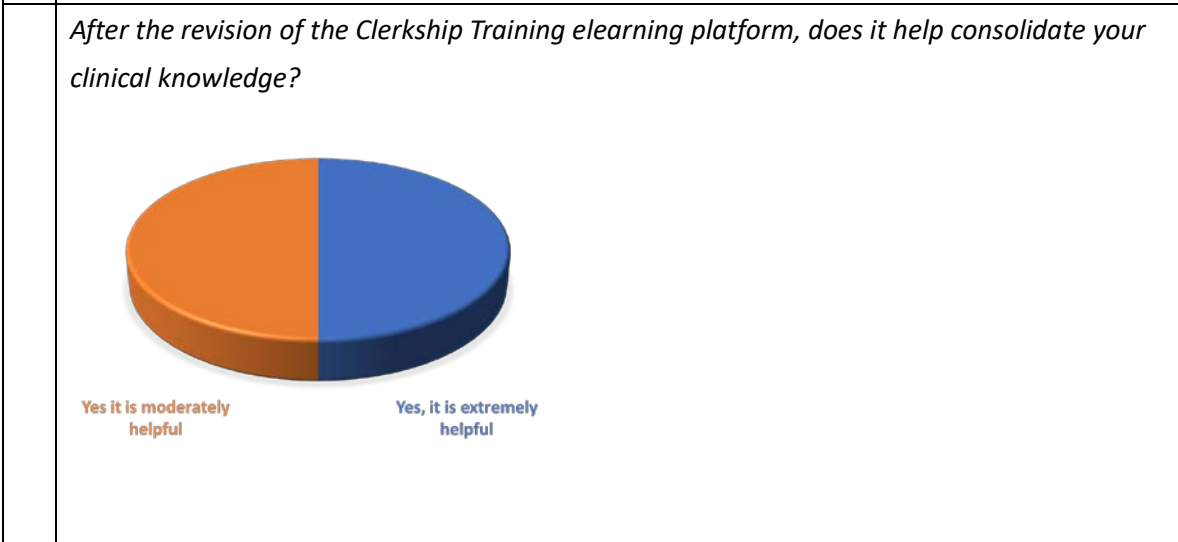
1.	<p>For the pre-experiences survey</p> <p><i>What are you feeling towards OSCE preparation?</i></p>  <table border="1"> <thead> <tr> <th>Anxiety Level</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Not at all anxious</td> <td>10</td> </tr> <tr> <td>slightly anxious</td> <td>30</td> </tr> <tr> <td>moderately anxious</td> <td>55</td> </tr> <tr> <td>extremely anxious</td> <td>10</td> </tr> </tbody> </table>	Anxiety Level	Percentage	Not at all anxious	10	slightly anxious	30	moderately anxious	55	extremely anxious	10
Anxiety Level	Percentage										
Not at all anxious	10										
slightly anxious	30										
moderately anxious	55										
extremely anxious	10										
	<p><i>What are your expectations in this pilot courseware?</i></p> <ul style="list-style-type: none"> - familiarize with P/E skills and OSCE setting - I hope I can learn how to easily remember what to do in OSCE. Also, I hope I will be more confident in doing physical examination after using the courseware. - I hope the objectives of the e-learning course is aligned with the assessment criteria that the OSCEs look for. i.e. what we learn here on the eLearning platform can be directly applied to the OSCEs in the future - After the course, hopefully I can understand the signs and symptoms in Abdomen examination. Can complete PE in 6 mins. - Be familiar with the approach to OSCE stations - as daily revision and keep my momentum for osce - Allows me to better prepare for clerkship/OSCE - I hope to learn all the basics that are required of medical students to pass the 										

OSCE. Also, that there are some videos or demonstrations to help us visualize the examination itself. Often times, we know the textbook knowledge but lack practice. We need to keep practicing and simulating a real life examination to do well.

- to have more understanding about OSCE
- To have a good start on what to study and what are the implications of signs



2. Post-experiences Survey



3.	Overall experiences survey	
	The participants expressed whether they strongly disagree (1), disagree (2), neutral (3), agree (4) or strongly agree (5) to the questionnaire statements. The feedback score was the average of the all Likert scales.	
	<i>How is level of helpfulness of the eLearning Tool to overcome the OSCE stress?</i>	The feedback score was 4.25 which they agreed of the statement.
	<i>Overall, I like to the Clerkship Training eLearning Tool.</i>	The feedback was 4.85 which they tended to strongly agree of the statement.

According to the data analysis, our team conclude that mPACS is the innovative and interactive courseware that can engage students learning experience via mobile devices in combination of traditional face-to-face delivery learning, reinforce their cognitive connections in foundational knowledge and clinical skills through case scenarios studies exercise for differential diagnosis of the diseases for experiential learning; and deepen the clinical skill by on-line formative assessment by personalized instruction study approach in the sophistication of professional knowledge. We also concur that the flipped style of mPACS fosters clerkships' the clinical knowledge without geographical barrier at any time at higher levels of motivation. Moreover, mPACS relief their anxiety and make confidently to sit for the OSCE.

4. Dissemination, diffusion and impact

Our innovative flipped courseware is helpful in preparing students in the transition while on clinical clerkships and reinforce the commitment to professional principles while they transit to their new roles as student physicians on health care teams with less anxiety level. The mPACS has been upload to the Blackboard entitled as "2018 Clerkship Training eLearning Tool (MEDU-CT)" for the trial run. Also, our team will present our work in the coming CUHK innovative Teaching & Learning Expo on 7 Dec 2018. There are four micro-modules that are disseminated in the trial run as listed:

- Micro-module 1: Clinical Skills – Bedside Physical Examination
- Micro-module 2: Virtual Practice of Clinical Skill – Bedside Physical Examination
- Micro-module 3: OSCE Guide: Diagnosis of Chronic Liver Disease
- Micro-module 4: OSCE Guide: Clinical Significances during the Bedside Physical Examination

Concerning the pedagogical goals of the competent professional teaching, our team focus on the development of the scope of the content for mPACS covered micro-modules and on-line assessments for the clerkship training, which may have the positive impact to:

- a. Design an innovative and interactive courseware, engaging students learning experience via mobile devices in combination of traditional face-to-face delivery learning.
- b. Foster students' understanding in the perspective exploration of the training outcomes;
- c. Reinforce cognitive connections in foundational knowledge and clinical skills

- through case scenarios studies exercise for differential diagnosis of the diseases for experiential learning; and
- d. Deepen the clerkship training by on-line formative assessment by personalized instruction study approach in the sophistication of professional knowledge.
 - e. Relief the stress level to prepare the OSCEs.

PART II

Financial data

Funds available:

Funds awarded from MMCDG	\$	100,000
Funds secured from other sources (please specify _____)	\$	NIL
Total:		\$ 100,000

Expenditure:

PART III

The expenditure has been provided as listed:

Item including the job of Development	Amount (HK\$)	Quotations / Competitive bids
Development and Implementation of mPACS		
1. Build-up storyboard for video clips and courseware a) 30 x 3 min. video [Clinical study discussions] b) 2 x 8 min. video [Clinical significance] c) Set up storyboard for Interactive Courseware		ITSC
2. Video Shooting for video clips a) 30 x 3-min. [Clinical study discussions] b) 2 x 8-min. [Clinical significance] c) 2 x 8-min. video report (interim & final)		
3. Chromakey Video Studio & Audio Recording Rental Rental fee for the ITSC Chromakey Studio location at Rm. 101, Pi Chiu Bldg. CUHK for: - Chromakey Video Shooting - Audio Recording		
4. Video Editing for video clips a) 30 x 3min. [Clinical study discussions] b) 2 x 8 min. [Clinical significance] c) 2 x 8 min. video report (interim & final)		
5. Graphic and UI Design for Courseware and assets illustration		
6. Set up the implementation of Courseware Development 30 x Scenario-based Video Integration with Storyline to LMS		
7. Panotop In-Video Quiz Integration for Two Scenarios Case study videos (2x 8 min.) Basic Icon and graphic design for the courseware User Interface design- max 10 assets illustration		
8. Project Poster Design Poster Design for conference presentation - Simple graphic & assets illustration - Final output is in digital format only - with 1 revision		
Subtotal	65,000	
Manpower to support the development of mPACS		

1.	Standardized patients for clinical study discussion: 5 visits for 5 micro-modules of 5 topics (@\$800/visit)	Not applicable
2.	A student helper for content preparation:200 hrs with MPF (rate is @\$58/hr)	
Dissemination of mPACS		
1.	Proofread, editing other expenses	Not applicable
	Subtotal	35,000
	Total	100,000

Lessons learnt from the project

According to the data analysis, our team conclude that the mPACS is the innovative and interactive courseware which can engage students learning experience via mobile devices in combination of traditional face-to-face delivery learning, reinforce their cognitive connections in foundational knowledge and clinical skills through case scenarios studies exercise in differential diagnosis of the diseases for experiential learning; and deepen the clinical skill by on-line formative assessment by personalized instruction study approach in the sophistication of professional knowledge.

The preliminary data of the surveys have been shown the effectiveness of the mPACS can fulfill students' expectation to lease anxiety for preparation their OSCE. Moreover, mPACS can be role model for future development of the flipped classroom elearning courseware in bridging the transition for the clerkship training.

PART IV

Information for public access

While we live in the digital information explosion world, the didactic classroom teaching may not be the only way for the university pedagogy studies. The flipped classroom is the new concept that teacher gives the online learning progress for students to study freely at home. In the clinical curriculum of Faculty of Medicine, clerkship training provides medical students comparable experiences across clinical sites and core didactic curricula for the application of knowledge in clinical medicine. As clerkship training is to make students become doctors, our flipped courseware of mPACS has been built up as a showcase in the abdominal physical examination for the flipped classroom of blended learning. In the content of the micro-modules, the clerkships can acquire the learning materials involved competency professional training in clinical knowledge seeking, critical thinking, interpretation of the data of the medical tests and capable of communicating with patients. More importantly, mPACS also relief their anxiety to sit for the on-going objective structural clinical examinations for their professional competence.

1. Keywords

(Most relevant) Keyword 1: digital information explosion

Keyword 2: flipped classroom

Keyword 3: micro-modules

Keyword 4: clerkship training

(Least relevant) Keyword 5: clinical knowledge seeking

2. Summary

Table 1: Publicly accessible online resources (if any)
<p>(a) Project website:</p> <p>The website is under construction and will be coming soon.</p>
<p>(b) Webpage(s):</p> <p>NIL</p>
<p>(c) Tools / Services:</p> <p>Not Application</p>
<p>(d) Pedagogical Uses:</p> <p>Our team has just done the pilot study for the flipped classroom activities, i.e. 2018 Clerkship Training eLearning Tool (MEDU-CT) which has been launched in the Blackboard.</p>
<p>(e) Others (please specify):</p>

Table 2: Resources accessible to a target group of students (if any)			
<u>Course Code/ Target Students</u>	<u>Term & Year of offering</u>	<u>Approximate No. of students</u>	<u>Platform</u>
2018 Clerkship Training eLearning Tool (MEDU-CT)	1 st Term 2018	20 (Trial Run)	Blackboard
Table 3: Presentation (if any)			Number
Please classify each of the (oral/poster) presentations into one and only one of the following categories			
(a) In workshop/retreat within your unit (e.g. department, faculty)			NIL
(b) In workshop/retreat organized for CUHK teachers (e.g. CLEAR workshop, workshop organized by other CUHK units)			NIL
(c) In CUHK ExPo jointly organized by CLEAR and ITSC			1
Title for the Oral and Poster presentation:			

Clinical Skills Training in Medical Clerkship: The Effectiveness of Integration of mobile Learning	
(d) In any other event held in HK (e.g. UGC symposium, talks delivered to units of other institutions)	NIL
(e) In international conference	NIL
(f) Others (please specify)	NIL

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	NIL
(b) Project leaflet	NIL
(c) Project booklet	NIL
(d) A section/chapter in a booklet/ book distributed to a limited group of audience	NIL
(e) Conference proceeding	NIL
(f) A chapter in a book accessible internationally	NIL
(g) A paper in a referred journal	NIL
(h) Others (please specify)	NIL

3. A one-page brief write up

At present, medical year 4 students become the junior medical clerkships in the clinical curriculum. Besides of the adaption of the transition period for the new study environment, they are also required to sit for the Objective Structural Clinical Examinations (OSCEs) for the day-one professional competence. With such high stress levels, they are anxiety to have the negative impact on their studies.

Current MBChB programme integrates the concept of the flipped classroom in the teaching curriculum, where students receive exposure of basic knowledge before the didactic practicums. There are plenty of teaching tools in the learning of science but lack a cognitive integration in critical connections to clinical signs and symptoms for differential diagnosis of the diseases.

Our team has been built up an interactive mobile application entitled *mPACS* (mobile Pass A+ in Clinical Studies) to facilitate the development of critical thinking in clinical practice among clerkship training. The pilot study of the project aims to develop

micro-modules related to bedside physical examination, chronic liver diseases and its clinical signs for training the ability to think critically, where students acquire skills in the differential diagnosis as such logistic connection is no rules or textbook to define, quantity or teach. It is helpful in preparing students in the transition period on clinical clerkship training and reinforce the commitment to professional principles on health care teams with less anxiety levels.

Project outcome has been evaluated by anonymous survey and focus group study among students for the trial run. From the overall experience survey, the total feedback score of the 5-point Likert scales was 4.85 which fell between the categories of agree (4) and strongly agree (5). According to the data analysis, our team conclude that the mPACS is the innovative and interactive courseware that can engage students learning experience via mobile devices in combination of traditional face-to-face delivery learning, reinforce their cognitive connections in foundational knowledge and clinical skills through case scenarios studies exercise for differential diagnosis of the diseases for experiential learning; and deepen the clinical skill by on-line formative assessment by personalized instruction study approach in the sophistication of professional knowledge. More importantly, the mPACS may help to relief the preparation of OSCEs. The attached video is attached for the impact of our project in the innovative flipped classroom clerkship training as below:

https://gocuhk-my.sharepoint.com/:v/r/personal/taylor-tang_cuhk_edu_hk/Documents/Share/FlorenceTang/Heyson_Liver-MMCD/FinalReportV2.mp4?csf=1&e=Pa1UTc