

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: **An Interactive Journey to the Human Nephron (Phase 2): Renal Handling of Bicarbonate and Acid-Base Balance**

Principal supervisor: **Dr Isabel Hwang**

Co-supervisor(s): **Prof WH KO**

Department / Unit: **Division of Education, School of Biomedical Sciences**

Project duration: **From May 2017 to 31 July 2018**

Date report submitted: **31 July 2018**

1. Project objectives

The project is able to meet its objectives. There weren't major changes in the objectives as a result of the experience of working on the project. This is because the contents delivered on each micro-module has to be aligned with the lecture materials taught by the course teacher (Prof WH KO).

2. Process, outcomes or deliverables

Altogether, 5 micro-modules were produced as we combined the case studies from two micro-modules into one to facilitate viewing and grouping. All of the 5 micro-modules will all be delivered to year 2 medical students in Term II of academic year 2018-2019 (course code: MEDU2400).

Micro-module	Title	Download links
1	The importance of the bicarbonate buffer system	http://facs.med.cuhk.edu.hk/site/2017/reno1/story_html5.html
2	Reabsorption of filtered bicarbonate in renal tubules	http://facs.med.cuhk.edu.hk/site/2017/reno2/story_html5.html
3	How new bicarbonate ions are generated in the renal	http://facs.med.cuhk.edu.hk/site/2017/reno3/story_html5.html

	tubules	
4	A case of diabetic ketoacidosis	http://facs.med.cuhk.edu.hk/site/2017/reno4/story_html5.html
5	A case of Conn's syndrome	http://facs.med.cuhk.edu.hk/site/2017/reno5/story_html5.html

Viewing time of each micro-module lasts around 10-15 minutes and total duration for all videos will be approximately 50 minutes to 75 minutes. The style of each micro-module is formatted similarly (powerpoint slides, colorful animations and flow diagrams) to facilitate usage and viewing by the student users. On the left side of each page, there are menu bars indicating sub-sessions of each micro-module. As indicated in our application proposal, student users will be able to re-visit at their own pace and time. All the texts provided on the micro-module videos were synchronized with audio narrations provided by student helpers. The nature of the deliverables have never been changed as we are already familiar with the type and style of online learning materials medical students prefer. The timeline of the project development has suffered some delay and they are mostly due to human factors. For example, we realized that we needed more time to agree with the contents covered in the micro-modules between preclinical and clinical teachers. This is essential as we aim to offer vertical integration of our micro-modules into the medical curriculum in a long run. Another unexpected delay is our recording schedule clashed with the exam periods of the student helpers.

Overall, we are very happy with our products and we are also excited to hear any feedback from our students.

3. Evaluation Plan

We did not conduct any formal evaluation for the project yet but a more thorough evaluation will be conducted in May 2019 once year 2 medical students have accessed the micro-modules in the course. Similar to our previous practice, students will be asked to fill out online survey forms and group interviews may also be conducted to obtain more in-depth views from the student users.

4. Dissemination, diffusion and impact

It is foreseen that the project has diffusion potential in other non-medical courses as similar subjects are covered. The project result will provide important information when similar format of micro-modules are to be developed in future for similar or different subjects.

PART II

Financial data

Funds available:

Funds awarded from MMCDG \$ **63,310**

Funds secured from other sources \$ **0**

(please specify _____)

Total: \$ 63,310

Expenditure:

Company	Item	Qty	Currency	Unit Price	Percentage	Total	Total(HKD)	PI	AC	Account Code	Job No.	Invoice No.	Invoice date	Paid date
MICROWARE LIMITED	Lenovo ThinkPad x1 Carbon G5	1	HKD	9896	100	9896	9896	HWANG Shui Shan Isabel	3210788	151001	1610257	111712853	20170724	20170801
YUNG LIK KIN ALEX	WD My passport Ultra 2tb Ver. 2016 (yellow) WDBYFT0020BYL	1	HKD	630	100	630	630	HWANG Shui Shan Isabel	3210788	590014	1611146	C43B/061817/848093	20170618	20170710
42 ARTE	illustrations for Acid-Base Micromodules One to Six - conultation included , final illustrations will be provided in jpeg and ai formats	1	HKD	8000	100	8000	8000	HWANG Shui Shan Isabel	3210788	590107	1701149	1642013	20170802	20170814
ARMSTRONG-HILTON	editing service	1	HKD	550	100	550	550	HWANG Shui	3210788	590107	1701288	ED-15140	20170810	20170816

LIMITED								Shan Isabel						
ARMSTRONG-HILTON LIMITED	editing service	1	HKD	390	100	390	390	HWANG Shui Shan Isabel	3210788	590107	1702040	ED-15432	20170908	20170921
NG SHEUNG YI	Contract for service, 30/9 - 15/10/2017 : to draw images of human organ esp. kidneys in different forms, to draw graphs, to provide free revisions to all complete products upon course development. (total: 15 images)	1	HKD	2250	100	2250	2250	HWANG Shui Shan Isabel	3210788	505003	1702245	Nil	20170918	20170922
ARMSTRONG-HILTON LIMITED	editing service	1	HKD	412.5	100	412.5	412.5	HWANG Shui Shan Isabel	3210788	590085	1702452	ED-15654	20170925	20170928
ARMSTRONG-HILTON LIMITED	editing service	1	HKD	495	100	495	495	HWANG Shui Shan Isabel	3210788	590085	1702824	ED-15842	20171012	20171017
KUNG WING TUNG	student helper , March - Sept., 2017	1	HKD	693.02	100	693.02	693.02	HWANG Shui Shan Isabel	3210788	505004	1605225	Nil	20180423	20180423
ARMSTRONG-HILTON LIMITED	editing service	1	HKD	390	100	390	390	HWANG Shui Shan Isabel	3210788	590107	1705935	ED-17752	20480206	20180212
WAI JANAE WENTONG	student helper, 25/11/2017 - 13/12/2017	1	HKD	1155	100	1155	1155	HWANG Shui Shan Isabel	3210788	555004	1706343	Nil	20180201	20180305
ITSC	service for courseware, multimedia development and studio related service	1	HKD	15540	100	15540	15540	HWANG Shui Shan Isabel	3210788	590107	1706729	2017-18-017	20180315	20180322
OFFICE OF MEDICAL	courseware development and	1	HKD	20000	100	20000	20000	HWANG Shui	3210788	590107	1706823	Nil	20180327	20180327

EDUCATION	support								Shan Isabel					
ARMSTRONG-HILTON LIMITED	editing service	1	HKD	503	100	503	503	HWANG Shui Shan Isabel	3210788	557001	1707477	ED-18493	20180420	20180424
ARMSTRONG-HILTON LIMITED	editing service	1	HKD	540.5	100	540.5	540.5	HWANG Shui Shan Isabel	3210788	590107	1707478	ED-18314	20180406	20180424
KWONG JING TING DEBORAH	student helper, 21/3/2018	1	HKD	346.5	100	346.5	346.5	HWANG Shui Shan Isabel	3210788	505004	1800084	Nil	20180705	20180705
LAI WING CHUEN	student helper, 25/5/2018	1	HKD	462	100	462	462	HWANG Shui Shan Isabel	3210788	505004	1800084	Nil	20180705	20180705
WAI JANAE WENTONG	student helper, 23-24/5/2018	1	HKD	866.25	100	866.25	866.25	HWANG Shui Shan Isabel	3210788	505004	1800084	Nil	20180705	20180705
THE COMMERCIAL PRESS (HK) LTD	stationery	1	HKD	178.2	100	178.2	178.2	HWANG Shui Shan Isabel	3210788	555004	1800469	1800468336	20180629	20180724
ARMSTRONG-HILTON LIMITED	editing service	1	HKD	377.5	3.19	12.03	12.03	HWANG Shui Shan Isabel	3210788	590107	1800470	ED-19374	20180703	20180724

PART III

Lessons learnt from the project

Students appreciate additional online and animated videos summarizing complicated mechanisms for their further study and revision. Case-based scenarios also allow them to better apply their knowledge and practice their critical thinking before promoting to clinical years.

Key success factors:

1. A flexible working team that allows revision of contents based on course development
2. Animated videos to visualize complicated mechanisms synchronized with audio narrations
3. Self-checked exercise to test understanding and critical thinking
4. Student helpers who are interested in medical education and provide informal feedback from time to time

Difficulties encountered

1. Agreement of final contents between preclinical and clinical project members took longer than expected

Suggestions to CUHK

1. The project duration is less than one year which is not ideal as we need students' feedback to decide whether we need to further revise/improve the micro-modules to ensure sustainability of the videos
2. It was almost impossible to get an absolute accurate estimation on the number of student helper hours required for the project (also for previous projects). There are too many unknowns such as some student helper requires more preparation time and took longer to complete the recording.
3. It is not clear whether registration fee and air ticket is allowed as budget for the project. The team members only recently discovered that some other grant holders made use of the grant to attend conferences.
4. It is not known whether we needed to allocate some budget for the MPF. The system is not clear
5. Many grant holders depend on the same small team of technical staff in ITSC to develop micro-modules and it became a well-known (also well-accepted) fact that there will be expected delay for completing the project
6. The number of hours to develop source materials of each micro-module can be significant and it is sadly not well recognized by our School. If CUHK can set up some policy to allow teachers to declare number of hours used for micro-module developments as part of their teaching, e-learning may prosper more in the university
7. The short duration to spend the grant means that we need to seek other sources of

financial support if we need to further improve the completed micro-modules

PART IV

Information for public access

Our project produced 5 micro-modules for year 2 medical students. These modules are aligned with the lecture contents to be delivered by the course teacher. These include:

Micro-module	Title
1	The importance of the bicarbonate buffer system
2	Reabsorption of filtered bicarbonate in renal tubules
3	How new bicarbonate ions are generated in the renal tubules
4	A case of diabetic ketoacidosis
5	A case of Conn's syndrome

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: renal
 Keyword 2: bicarbonate
 Keyword 3: physiology
 Keyword 4: acidosis

(Least relevant) Keyword 5:

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: <i>It is still being finalized by team member of ISC and thus the download link is not yet available.</i>
(b) Webpage(s): NA
(c) Tools / Services: <i>Articulate storyline, Audacity</i>

(d) Pedagogical Uses:

The micro-modules for this project will be mainly used as post-class learning activity in order to encourage more in-depth and independent learning.

(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.

<u>Course Code/ Target Students</u>	<u>Term & Year of offering</u>	<u>Approximate No. of students</u>	<u>Platform</u>
MEDU2400	2 nd term of 2019	Over 250	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)	NA
(b) In workshop/retreat organized for CUHK teachers (e.g. CLEAR workshop, workshop organized by other CUHK units)	NA
(c) In CUHK ExPo jointly organized by CLEAR and ITSC	<i>Will submit an abstract for EXPO 2018</i>
(d) In any other event held in HK (e.g. UGC symposium, talks delivered to units of other institutions)	NA
(e) In international conference	<i>Will submit an abstract with other related micro-modules (from phase 1 project) to AMEE 2019</i>
(f) Others (please specify)	NA

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	NA
(b) Project leaflet	NA

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

3. A one-page brief write up

Our project created total of five micro-module videos. The first three micro-module videos provided narrated animated videos on the bicarbonate ion handling in the human kidney tubules. Two other micro-modules introduced common clinical cases that year 2 medical students will encounter more often when they progress to clinical years.

Each micro-module covered the necessary information medical students are required to understand. Synchronised narrations improve ease of understanding and the contents are aligned with correct sequence with the course lectures which will be conducted in term II of 2019. Self-checked exercises also aim to encourage usage of the micro-modules as assessment drives learning.

The micro-modules will be available to all year 2 medical students enrolled in Human Function (MEDU2400) in the coming Term II, 2019. Students will be asked to view the micro-modules after coming to class. A formal evaluation regarding these micro-modules will be carried out to receive feedback from the student users for further improvement in future.