

THE CHINESE UNIVERSITY OF HONG KONG

Micro-Module Courseware Development Grant

Scheme 1: Basic Scheme

Final Report (2017-18) (Additional Call)

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: **Nurturing Critical Thinking for Holistic Patient and Psychiatric Drug Therapy Assessment with Utilization of Virtual Pharmacy Simulation**

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Project duration: From March 2018 to October 2018

Date report submitted: November 1st 2018

1. Project objectives

To cultivate student's ability to conduct holistic patient and drug therapy assessment, we developed an interactive pharmacy virtual simulation programme with animation characteristics using psychiatric patient cases.

The objectives of the virtual programme are to

1. Enable pharmacy students to **conduct holistic patient interview** upon patient's symptom presentation in a hospital / community setting.
2. Enhance **critical thinking skills**; derive appropriate responses and chain of reactions based on patient's individual characteristics.
3. Cultivate the **ability to customize patient care** and **solve problems** under a safe and simulated environment.
4. Consolidate and **apply the knowledge attained** from classroom teaching in **real-life** scenarios.

The project is on track to meet its objectives. Six virtual cases and two virtual reality videos have been developed and will be used in the course PHAR 3414 in Spring 2019.

2. Process, outcomes or deliverables

In collaboration with the ITSC, a web-based, interactive pharmacy virtual simulation programme with animation characteristic was developed. Six animated case scenarios featuring the three stages of presentation of two patients were produced. The three stages were:

1. screening/initial patient interview,
2. therapy assessment and
3. adverse effect management.



Figure 1. Screen capture of case 1 (depression) screening/initial patient interview

What question should I ask the patient to better assess the patient's condition?

Type in 5 questions you think it is most important to ask.

Submit

Figure 2. Screen capture of case 2 (bipolar disorder), free-text entry for therapy assessment.

In addition, two 360 virtual reality videos of the two patients' symptom complaints have been produced.

The programme will be used in the course PHAR 3414 Pharmacology and Therapeutics 3 in Spring 2019.

Course code: PHAR 3414 Pharmacology and Therapeutics 3

Micro-module number and setting	Theme of micromodule/ scenario	Virtual Patient	Presentation styles	Duration of student contact time
1 Community	Depression - Screening/initial patient interview	Ms A	Animation (interactive patient case)	~13 mins
2 Community	Depression - Therapy assessment	Ms A	Animation (interactive patient case)	~17 mins
3 Community	Depression - Adverse effect and management	Ms A	Animation (interactive patient case)	~16 mins
4 Hospital	Bipolar disorder - Screening/initial patient interview	Mr B	Animation (interactive patient case)	~16 mins

5 Hospital	Bipolar disorder - Therapy assessment	Mr B	Animation (interactive patient case)	~21 mins
6 Hospital	Bipolar disorder - Adverse effect and management	Mr B	Animation (interactive patient case)	~20 mins
Total duration of time:				103 mins
360 VR video number and setting	Theme of 360 VR video	Virtual Patient	Video presentation styles	Duration of video
1 Indoor (Patient's bedroom)	Depression symptoms	Ms A	Video (patient case/drama)	1 min
2 Outdoor	Bipolar disorder symptoms	Mr B	Video (patient case/drama)	30 sec
Total duration of time:				1 min 30 sec

The nature of the deliverables have not been changed and the timeline is adhered to. The project is completed satisfactorily.

3. Evaluation Plan

As PHAR 3414 Pharmacology and Therapeutics 3, the intended course for use of the micromodules, is scheduled in Spring semester annually, we tested the programme with a group of students who have recently taken the course. Student surveys were conducted by questionnaires. The surveys assessed students' perception on the extent to which the project may have achieved its objectives, specifically on its ability to

- Enable pharmacy students to conduct holistic patient interview upon patient's symptom presentation in a hospital / community setting.
- Enhance critical thinking skills; derive appropriate responses and chain of reactions based on patient's individual characteristics.
- Cultivate the ability to customize patient care and solve problems under a safe and simulated environment.
- Consolidate and apply the knowledge attained from classroom teaching in real-life scenarios.

Other monitoring data collected include:

- Difficulty level of the exercise
- Time required to complete each exercise

Based on the feedback collected, students seem to have gained a better understanding on how therapeutic knowledge can be applied in real life scenarios. Some students also expressed that the cases assisted the learning of important counselling techniques with the simulated patient feedback. The exercises were good as a revision for learned topic. We are encouraged by the feedback and persuaded that the programme has achieved its objectives.

4. Dissemination, diffusion and impact

Dissemination:

The interactive pharmacy virtual simulation programme may be accessed through Blackboard. At the moment a testing Sandbox "CU-2018 Blackboard Sandbox Course (ITSC-SC0081)" has been assigned in Blackboard.

The two 360 virtual reality videos are accessible at

- (1) **Depression:** <https://www.youtube.com/watch?v=RxMXU-JGLos>
- (2) **Bipolar:** <https://www.youtube.com/watch?v=RHEDNq6WUrw>

We plan to present the project in the upcoming Teaching & Learning Expo 2018 and future pharmacy educational conferences.

Diffusion:

The exercises we created may also be used for student's self-practicing for OSCE (Objective Structured Clinical Examination) exam, the patient assessment and counseling domain.

Impact:

Apparently the use of case scenarios in micromodules have not been a common practice by far. There have been concerns about the complexity involved especially with the interdependence of patient responses encountered in a patient case. With the successful construction of the current programme, we look forward to sharing our experience in various platform for other discipline's consideration.

PART II

Financial data

Funds available:

Funds awarded from MMCDG \$ 99,808

Funds secured from other sources \$ _____
 (please specify _____)

Total: \$ 99,808

Expenditure:

Item	Budget as per application	Expenditure	Balance
Staff cost	30,408	28,917	+1,491
Student helper	7,700	9,558	-1,858
Service cost	60,000	60,000	0
Evaluation cost	1,700	200	+1,500
Total:	99,808	98,675	+1,133

PART III

Lessons learnt from the project

The use of the developed virtual interactive programme with animation can be expanded to incorporate more cases of different disease states. There are three other courses in the same series of pharmacology and therapeutics that share identical goals and objectives with PHAR 3414. The three other courses will benefit from incorporating a virtual interactive programme to allow application of therapeutic knowledge in patient cases as well. The existing programme can also be used in the course PHAR 4304 Clinical Psychiatry Clerkship. Students in PHAR 4304 can use the programme to better prepare themselves before experiencing direct patient contact in the actual hospital setting.

From the student's feedback, we also learnt that students indeed appreciated the free-text entry prompts that forced them to think independently on how to solve problems, in contrast to the usual, multiple-choice only entry. In response to the students' feedback, we had added more free-text entry questions.

Key success factors and the role of other units in providing support:

The key factor that contributed to the success of the programme include the followings:

- *Fulfilling an unmet need in the current curriculum:* When a pharmacist is expected to evaluate patients for potential drug-related problems, asking the right questions to obtain relevant information and properly assess them with clinical knowledge and holistic mindset is crucial for the development of subsequent action plans. This process needs to be repeatedly practiced and reinforced with real-life scenarios to solidify critical thinking and knowledge application abilities. The current programme provides important opportunities for such practice.
- *Strong ITSC support:* The ITSC personnel (Mr Taylor Tang) involved in the project is very dedicated

with the technical design. He has provided the most important guidance and hands-on programme construction that are essential to make the project a reality.

- *Dedicated student helpers and part time research assistant: The research assistant and student helpers delivered high quality of work under minimal supervision. Their feedback had also been instrumental to the continuous refinement of the programme.*
- *Collaboration with multiple departments: All the co-supervisors of the project provided invaluable feedback and suggestions to move the project forward.*

Difficulties encountered and remedial actions taken

- The most difficult aspect of the project is the possibility of incorporating assessment to the current design. With the understanding that assessment drives learning, we considered the possibility of incorporating assessment in the current exercise. However, since there are often multiple correct answers involved in each patient assessment steps, the counting of marks can be quite complicated and causes unnecessary distraction in this already sophisticated exercise. Therefore, we decided to retain the function of awarding points in the programme, yet make the scoring student-attempt oriented rather than performance-oriented.

Suggestions to CUHK

Certainly, it would be extremely helpful if more time can be allocated to the project implementation. We understand the proposal evaluation process takes time and it would be logical that the deadline of project completion be adjusted with consideration of the delay.

PART IV

Information for public access

1. Keywords

- | | |
|------------------|---------------------------------------|
| (Most relevant) | Keyword 1: Interactive case |
| | Keyword 2: Psychiatric case study |
| | Keyword 3: Drug related problems |
| | Keyword 4: Adverse effect management |
| (Least relevant) | Keyword 5: Virtual reality simulation |

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:**

360 virtual reality videos:

(3) **Depression:** <https://www.youtube.com/watch?v=RxMXU-JGLos>(4) **Bipolar:** <https://www.youtube.com/watch?v=RHEDNq6WUrw>**The six interactive case study with animation characteristics will be available on blackboard.****(b) Webpage(s):**

N/A

(c) Tools / Services:*ITSC services***(d) Pedagogical Uses:****The use of this interactive virtual animation will support the flipped classroom approach. The course teachers will make use of the class-time for higher order discussion with students.****(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>
<i>Phar 3414</i>	<i>2nd term 2018-2019</i>	<i>58</i>	<i>Blackboard</i>

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)

no

(b) In workshop/retreat organized for CUHK teachers (e.g. CLEAR workshop, workshop organized by other CUHK units)

no

(c) In CUHK ExPo jointly organized by CLEAR and ITSC

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	<i>Expo 2018 (Ref# E17)</i>
(d) In any other event held in HK (e.g. UGC symposium, talks delivered to units of other institutions)	<i>no</i>
(e) In international conference	<i>no</i>
(f) Others (please specify)	<i>no</i>

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	<i>no</i>
(b) Project leaflet	<i>no</i>
(c) Project booklet	<i>no</i>
(d) A section/chapter in a booklet/ book distributed to a limited group of audience	<i>no</i>
(e) Conference proceeding	<i>no</i>
(f) A chapter in a book accessible internationally	<i>no</i>
(g) A paper in a referred journal	<i>no</i>
(h) Others (please specify)	<i>no</i>

3. A one-page brief write up

For pharmacist to evaluate patients for potential drug-related problems, asking the right questions to obtain relevant information and properly assess them with clinical knowledge and holistic mindset is crucial. This process needs to be repeatedly practiced and reinforced with real-life scenarios to solidify critical thinking and knowledge application abilities.

To cultivate student's ability to conduct holistic patient and drug therapy assessment, an interactive pharmacy virtual simulation programme with animation characteristics was developed using psychiatric patient cases.

Six simulated videos featuring scenarios on screening/initial patient interview, therapy assessment and adverse effect management were developed. To portray patient experience, two Virtual-Reality videos featuring patient symptoms were created. Students can participate in hands-on patient assessment by, entering in free-text, the questions they shall ask the patient in various scenarios. They will also be prompted to choose from pull-down menu the responses they shall give after assessing the relevant information collected from the virtual psychiatric patients. The modules will be used as part of the flipped classroom strategies of the course PHAR 3414 Pharmacology and therapeutics 3 in Spring semester.

This interactive pharmacy virtual simulation programme allows students to visualize the real life situations, interview patients with specific questions and generate responses accordingly. Student's observational skills for clinical signs could also be enhanced with the animations and videos. Based on preliminary student feedback, student can see knowledge application to real life scenarios involving patient assessment and counseling. They also appreciated the free-text entry which forced them to think independently on how to solve problems.