

**THE CHINESE UNIVERSITY OF HONG KONG**

**Courseware Development Grant (2018-19)**

**Final Report**

**PART I**

Project title: **An Interactive Journey to the Human Nephron (Phase 3): How diuretics work?**

Principal supervisor: Dr Isabel HWANG

Co-supervisor(s): Prof WH KO and Prof Nelson TANG

Department / Unit: School of Biomedical Sciences, Faculty of Medicine

Project duration: From September 2018 to May 2019

Date report submitted: 8 July 2019

**1. Project objectives**

This project aims to enhance students' understanding of complex concepts involving the bodily mechanisms of diuretics. Animated videos with narrations were prepared per each type of common diuretics used in real life.

The project is on track to meet its objectives. During the development, we modified some of the storyboard in the video illustration based on students' feedback.

**2. Process, outcomes or deliverables**

Process:

For this project, we developed micro-modules which demonstrated the step-wise mechanisms of different kinds of diuretics. The micro-modules will be used by the medical students starting in the coming school year 2019-2020 (Term II).

| <b>Course title</b>           | <b>Course code</b> | <b>Year of Medical Study</b> | <b>Estimated number of students (for 2018-2019 curriculum)</b> |                                  |  |
|-------------------------------|--------------------|------------------------------|--|----------------------------------|--|
| Human Function I (Physiology) | MEDU2400           | 2                            | ~233   |                                  |  |
|                               |                    |                              | Normal entry: 188  | Direct Entry to Year 2 (DY2): 37 | Exchange students from mainland China: 8 |

Outcomes and deliverables:

The following micro-modules will be incorporated into the course MEDU2400 Human Function.

| No. | Name   | Brief description  | Estimated duration |
|-----|--|--|--------------------|
| 1   | How diuretics alters the water status of a patient | <ul style="list-style-type: none"> <li>• Real person role-playing video</li> <li>• Graphical illustration at different end points before and after taking diuretics</li> </ul> | ● 5 minutes        |
| 2   | Diuretics 1- carbonic anhydrase inhibitors         | ● Functions and common side effects through animations   | ● 5-8 minutes      |
| 3   | Diuretics 2 – loop diuretics                       |  | ● 5-8 minutes      |
| 4   | Diuretics 3- distal tubular diuretics              |  | ● 5-8 minutes      |
| 5   | Diuretics 4- collecting duct diuretics (K-sparing) |  | ● 5-8minutes       |

Links to the micro-modules:

[https://login.microsoftonline.com/84413781-bba6-45b3-bbe0-4f17c690da6a/oauth2/authorize?client\\_id=00000003-0000-0ff1-ce00-000000000000&response\\_mode=form\\_post&protectedtoken=true&response\\_type=code%20id\\_token&resource=00000003-0000-0ff1-ce00-000000000000&scope=openid&nonce=0026230995448463ACBDB1D18D5181C3D221F27A91137A82-EB6233C5E01E6627B0B15DCB655ADC9196133D8DFEFF445E81F27A3BCC2445FD&redirect\\_uri=https:%2F%2Fgocuhk-my.sharepoint.com%2F\\_forms%2Fdefault.aspx&wsucxt=1&cobrandid=11bd8083-87e0-41b5-bb78-0bc43c8a8e8a&client-request-id=cc1bee9e-00d8-9000-00f8-6b753f6d0ff5](https://login.microsoftonline.com/84413781-bba6-45b3-bbe0-4f17c690da6a/oauth2/authorize?client_id=00000003-0000-0ff1-ce00-000000000000&response_mode=form_post&protectedtoken=true&response_type=code%20id_token&resource=00000003-0000-0ff1-ce00-000000000000&scope=openid&nonce=0026230995448463ACBDB1D18D5181C3D221F27A91137A82-EB6233C5E01E6627B0B15DCB655ADC9196133D8DFEFF445E81F27A3BCC2445FD&redirect_uri=https:%2F%2Fgocuhk-my.sharepoint.com%2F_forms%2Fdefault.aspx&wsucxt=1&cobrandid=11bd8083-87e0-41b5-bb78-0bc43c8a8e8a&client-request-id=cc1bee9e-00d8-9000-00f8-6b753f6d0ff5)

**3. Evaluation Plan**

We conducted a small group interview with 5-6 senior (medical year 3) students who have helped with our previous e-learning projects to evaluate our micro-modules and made finer revisions. A more formal survey will be conducted to the whole class when the course begins in Jan 2020.

**4. Dissemination, diffusion and impact**

The project will be incorporated into the course website and available for students enrolled in MEDU2400.

PART II

Financial data

Funds available:

|  |           |
|--|-----------|
| Funds awarded from CDG                                     | \$ 90,000 |
| Funds secured from other sources<br>(please specify _____) | \$ 0      |

Total: \$ 90,000



**Expenditure:**

| Item   | Qty | Currency | Unit Price | Percentage | Total  | Total(HKD) | PI                           | AC      | Account Code | Job No. | Invoice No. | Invoice date | Paid date |
|--|-----|----------|------------|------------|--------|------------|------------------------------|---------|--------------|---------|-------------|--------------|-----------|
| student helper, 23/12/2018                                     | 1   | HKD      | 462        | 100        | 462    | 462        | HWANG<br>Shui Shan<br>Isabel | 4170595 | 551504       | 1804176 | Nil         | 20190107     | 20190107  |
| electronic accessories, portable lock                          | 1   | HKD      | 569        | 100        | 569    | 569        | HWANG<br>Shui Shan<br>Isabel | 4170595 | 590041       | 1804881 | Nil         | 20190131     | 20190214  |
| student helper, 28/12/2018                                     | 1   | HKD      | 505.31     | 100        | 505.31 | 505.31     | HWANG<br>Shui Shan<br>Isabel | 4170595 | 551504       | 1805046 | Nil         | 20190214     | 20190214  |
| stationery   | 1   | HKD      | 214.2      | 100        | 214.2  | 214.2      | HWANG<br>Shui Shan<br>Isabel | 4170595 | 555004       | 1805066 | Nil         | 20181213     | 20190218  |
| taxi fare from CUHK to PWH for video shooting on 28 Nov., 2018 | 1   | HKD      | 61.4       | 100        | 61.4   | 61.4       | HWANG<br>Shui Shan<br>Isabel | 4170595 | 590091       | 1805048 | Nil         | 20181128     | 20190214  |
| student helper, 21/2 2019                                      | 1   | HKD      | 158.81     | 100        | 158.81 | 158.81     | HWANG<br>Shui Shan<br>Isabel | 4170595 | 551504       | 1805526 | Nil         | 20190305     | 20190305  |
| student helper, 26/2/2019                                      | 1   | HKD      | 220        | 100        | 220    | 220        | HWANG<br>Shui Shan<br>Isabel | 4170595 | 551504       | 1805526 | Nil         | 20190305     | 20190305  |

|  |   |     |        |     |        |        |                              |         |        |         |                |          |          |
|--|---|-----|--------|-----|--------|--------|------------------------------|---------|--------|---------|----------------|----------|----------|
| editing service  | 1 | HKD | 1800   | 100 | 1800   | 1800   | HWANG<br>Shui Shan<br>Isabel | 4170595 | 590017 | 1805576 | ED-22648       | 20190307 | 20190311 |
| RITM0013266<br>application/courseware/multimedia<br>service request 2018, An<br>interactive journey to the Human<br>Nephron (Phase 3): How diuretics<br>work ? | 1 | HKD | 67545  | 100 | 67545  | 67545  | HWANG<br>Shui Shan<br>Isabel | 4170595 | 557001 | 1805761 | ITF0002546     | 20190314 | 20190318 |
| editing service  | 1 | HKD | 1850   | 100 | 1850   | 1850   | HWANG<br>Shui Shan<br>Isabel | 4170595 | 557001 | 1805762 | ED-22743       | 20190315 | 20190318 |
| "The Craft of Scene Writing Beat<br>by Beat "  | 1 | HKD | 147.6  | 100 | 147.6  | 147.6  | HWANG<br>Shui Shan<br>Isabel | 4170595 | 590009 | 1805767 | 1800482818     | 20190308 | 20190318 |
| notebook   | 1 | HKD | 178.2  | 100 | 178.2  | 178.2  | HWANG<br>Shui Shan<br>Isabel | 4170595 | 555004 | 1806020 | 1800483416     | 20190321 | 20190327 |
| student helper, 12/3/2019  | 1 | HKD | 173.25 | 100 | 173.25 | 173.25 | HWANG<br>Shui Shan<br>Isabel | 4170595 | 551504 | 1806171 | Nil            | 20190403 | 20190403 |
| student helper, 13/3/2019  | 1 | HKD | 317.63 | 100 | 317.63 | 317.63 | HWANG<br>Shui Shan<br>Isabel | 4170595 | 551504 | 1806171 | Nil            | 20190403 | 20190403 |
| photo/image taking   | 1 | HKD | 440    | 100 | 440    | 440    | HWANG                        | 4170595 | 590085 | 1806578 | 082-1904-00347 | 20190414 | 20190423 |

|   |   |     |         |     |         |         |                              |         |        |         |          |          |          |
|---|---|-----|---------|-----|---------|---------|------------------------------|---------|--------|---------|----------|----------|----------|
|   |   |     |         |     |         |         | Shui Shan<br>Isabel          |         |        |         |          |          |          |
| editing service   | 1 | HKD | 805.5   | 100 | 805.5   | 805.5   | HWANG<br>Shui Shan<br>Isabel | 4170595 | 590107 | 1806626 | ED-22834 | 20190417 | 20190424 |
| editing service   | 1 | HKD | 232.3   | 100 | 232.3   | 232.3   | HWANG<br>Shui Shan<br>Isabel | 4170595 | 590107 | 1806627 | ED-22921 | 20190417 | 20190424 |
| development support for the project for an e-learning project entitled " an interactive journey to the human nephron (phase 3) : how diuretics work?" | 1 | HKD | 10000   | 100 | 10000   | 10000   | HWANG<br>Shui Shan<br>Isabel | 4170595 | 590107 | 1806903 | Nil      | 20190509 | 20190510 |
| flip chart with stand   | 1 | HKD | 750     | 100 | 750     | 750     | HWANG<br>Shui Shan<br>Isabel | 4170595 | 555004 | 1806904 | 1019578  | 20190424 | 20190510 |
| flip chart paper  | 1 | HKD | 58      | 100 | 58      | 58      | HWANG<br>Shui Shan<br>Isabel | 4170595 | 590085 | 1806904 | 1019578  | 20190424 | 20190509 |
| student helper, 29 April, 2019  | 1 | HKD | 231     | 100 | 231     | 231     | HWANG<br>Shui Shan<br>Isabel | 4170595 | 551504 | 1806948 | Nil      | 20190514 | 20190514 |
| student helper, 1-7 May, 2019   | 1 | HKD | 1732.51 | 100 | 1732.51 | 1732.51 | HWANG<br>Shui Shan<br>Isabel | 4170595 | 551504 | 1807179 | Nil      | 20190521 | 20190521 |

|                 |   |     |      |     |      |      |                              |         |        |         |          |          |          |
|-----------------|---|-----|------|-----|------|------|------------------------------|---------|--------|---------|----------|----------|----------|
| editing service | 1 | HKD | 1500 | 100 | 1500 | 1500 | HWANG<br>Shui Shan<br>Isabel | 4170595 | 590107 | 1807437 | ED-23679 | 20190527 | 20190604 |
|-----------------|---|-----|------|-----|------|------|------------------------------|---------|--------|---------|----------|----------|----------|

Total expenditure: HK\$89951.7





## PART III

### Lessons learnt from the project

The current project adds to the growing number of eLearning micro-modules available within the course. It is our objective to use these micro-modules to improve blended learning in this course.

The project had some key success factors that we think made the project successful:

- Multi-departmental team members and collaboration
  - ITSC has been providing tremendous and high quality support to create micro-modules
  - Office of medical education provides data analytics and maintenance of micro-module website
  - Clinical teacher from Prince of Wales Hospital provide realistic information about the usefulness of diuretics
  - Medical student helpers provided student perspectives on the project development
- Active student involvement in this project (e.g. to write up scripts, provide audio narration, student feedback to allow finer revisions of the micro-modules)

## PART IV

### Information for public access

*Summary information and brief write-ups of individual projects will be uploaded to a publicly accessible CUHK CDG 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 relevance to your project) to describe your project.*

(Most relevant)    Keyword 1: physiology

Keyword 2: diuretics

Keyword 3: micromodule

Keyword 4: blended learning

(Least relevant)    Keyword 5:

### **2. Summary statistics**

*Please provide information, if any, in the following tables, and provide the details in Part I.*

|   |
|---|
| <b>Table 1: Publicly accessible online resources (if any)</b> |
|---|

|  |
|--|
| <p><b>(a) Project website:</b></p> <p><i>If a publicly accessible project website has been constructed, please provide the URL</i></p>   |
| <p><b>(b) Webpage(s):</b></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><b>(c) Others (please specify):</b></p>   |

| <b>Table 2: Resource accessible to a target group of students (if any)</b>  |   |  |                 |
|---|---|--|-----------------|
| <i>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. CU Learning Management System (Blackboard), facebook), please specify.</i> |   |  |                 |
| <u>Course Code/<br/>Target Students</u>   | <u>Term &amp; Year of<br/>offering</u>  | <u>Approximate No.<br/>of students</u> | <u>Platform</u> |
| <i>e.g.: Dept of xxxx</i>   | <i>All 1<sup>st</sup> year students</i> | <i>40</i>                              | <i>facebook</i> |

| <b>Table 3: Presentation (if any)</b>   |                         |
|---|-------------------------|
| <i>Please classify each of the (oral/poster) presentations into one and only one of the following categories</i>  | <b>Number</b>           |
| (a) In workshop/retreat within your unit (e.g. department, faculty)   | <i>Please insert no</i> |
| (b) In workshop/retreat organized for CUHK teachers (e.g. CLEAR workshop, workshop organized by other CUHK units) | <i>Please insert no</i> |
| (c) In CUHK ExPo jointly organized by CLEAR and ITSC  | <i>Please insert no</i> |
| (d) In any other event held in HK (e.g. UGC symposium, talks delivered to units of other institutions)            | <i>Please insert no</i> |
| (e) In international conference   | <i>Please insert no</i> |
| (f) Others (please specify)   | <i>Please insert no</i> |

| <b>Table 4: Publication (if any)</b>  |                         |
|---|-------------------------|
| <i>Please classify each piece of publications into one and only one of the following categories</i> | <b>Number</b>           |
| (a) Project CD/DVD  | <i>Please insert no</i> |

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

### 3. A one-page brief write up

The goals of this project are to complete the remaining micro-modules that form an integral part of the e-learning environment for the course. In this project, *we aim to feature the clinical aspects of the use of diuretics to treat patients with hypertension*. These micro-module videos are interactive and present simultaneous audio narration and subtitles. The videos will supplement classroom teaching by providing a more complete blended e-learning environment. Some components of these micro-modules will contain quizzes as formative assessments to track students' ability to obtain the necessary information delivered in each micro-module. Students will be able to visualize how different categories of diuretics used in clinical practice work in the human kidneys. The key physiological and side effects will be represented through interactive animations.

The main benefits of the project will be the correction of common student misconceptions about the side effects of diuretics in different regions of the kidney tubules known as nephrons.