#### THE CHINESE UNIVERSITY OF HONG KONG

#### Micro-Module Courseware Development Grant

#### Scheme 3: eLearning Pedagogy Research

#### Final Report (2015-16)

Report due 31 January 2017 Please return by email to The Ad hoc Committee on Planning of eLearning Infrastructure <u>mmcd@cuhk.edu.hk</u>

#### PART I

Project title: E-Pilot Study (ePS) of the Micro-Modules in Teaching Anatomy and Physiology: Blended Learning Approach for the Health Professional Education in Faculty of Medicine
Principal supervisor: Dr. Florence Tang
Co-supervisor(s): Dr. Olivia Ngan, Dr. Aden Chen, Mr. Taylor Tang & Ms Daisy Chen
Department / Unit: School of Biomedical Sciences
Project duration: From February 2016 to March 2017
Date report submitted: 31 March 2017

#### **1. Project objectives**

In explosive digital information growth, the integration of on-line learning material with the didactic lecture of the blended learning is now proceeding commonly in university teaching practices. Especially for health profession education nowadays, students in the 90s' generation require electronic learning (e-Learning) besides of face-to-face teaching. However, the application of e-learning courseware in the blended learning for tertiary medical education is still immature. In this study, we would like to have a new e-learning pedagogy platform entitled as electronic Professional Study (ePS) in Anatomy teaching. There is not much well-established e-learning teaching courseware for health professional students to facilitate their learning. We provide an example to explore how the platform is adopted in blended learning, where empirical data from this project can provide understanding and evidence if developed ePS can facilitate students' learning and examination performance.

Our project is a pilot study to examine the relationship between simulation-based learning activities and assessment. The study provides an insight in how contemporary perspective of e-learning educational technology can strengthen teaching and learning qualities, by exploring facilitators and barriers for the application of the blending learning approach. The objectives of this study are to design appropriate courseware content to facilitate effective learning and to assess the impact of courseware and learning outcome by comparing students' courseware usage and class performance. In summary, our project has been on track to meet our objectives to facilitate students' learning process.

#### 2. Process, outcomes or deliverables

The three micro-modules of the ePS have been developed to support teaching and learning of Anatomy course, particularly focus on the cardiovascular system. We developed three micro-modules entitled "Heart Structure Investigation" in the micro-module 1, "Coronary Circulation" in the micro-module 2 and "Histology of Blood Vessels" in the micro-module 3. The objectives of each micro-module were listed as shown in Table 1.

Table 1. The objective and the design of the micro-modules were summarised.

Proposed Topic of Micro-module	Objectives and the Design
Micro-module 1: Heart Structure Investigation	<ul> <li>To understand core knowledge of both macroscopic and microscopic structures and functions of the heart</li> </ul>
	- Illustration of clinical implication related to gross anatomy of the heart with micro-lecture
	- ERROR Gamification 1
Micro-module 2: Coronary circulation	<ul> <li>To understand blood circulation through the ascending aorta to the heart muscle</li> </ul>
	<ul> <li>Illustration of clinical implication related to coronary circulation with the micro-lecture</li> </ul>
	- ERROR Gamification 2
Micro-module 3: Histology of blood vessels	<ul> <li>To understand histological structures of blood vessels, the exchange of material between the blood capillaries and surrounding tissues</li> </ul>
	- Illustration of clinical implication related to microscopic anatomy of blood vessel with micro-lecture
	- ERROR Gamification 3

We have designed and reconstructed the shooting photos into 360 degrees for the three-dimensional (3D) presentation in the study-paced elements facilitate their understanding the relationship of the anatomical structures in the first two micro-modules (See Figure 1). In the Micro-module 3, it covered the histological knowledge of the blood vessel with the blood cells (See Figure 2). We created a simple animation clip to introduce the types of blood cells in the blood vessels. More importantly, we demonstrated the histological arrangement of the layers in blood vessels with the illustrations. Besides, digital micrographs from different types of blood vessels were captured from the Digital Slide Boxes which were correlated with those illustrations.



Figure 1. Examples of histological illustrations. The arrangement of the layers of the wall of the (a) muscular vein; (b) capillary; (c) muscular artery; (d) the histological slide will pop out when the pointer is placed on the name of the structure



Figure 2. Temporal Accesses to the Courseware. \*Indicates formative assessment date, which was on 12<sup>th</sup> December, 2016. The solid-lined parenthesis indicates the teaching period of the cardiovascular system module. The first usage peak was noted in the first week of the module; the dotted-lined parenthesis indicates the second usage peak, which was on 30<sup>th</sup> November, 2016, which was two weeks before the formative assessment.

As to gamify the self-reflection of quizzes, we created a storyline and packed it into competitive interventions which increased the students' engagement. Moreover, the future space city in ePS (Figure 3a) was buildup in the year of 2046. The main cartoon character, Mrs Jackson (Figure 3b) who visited different departments for the cardiovascular health risk assessment. The cartoon robots, CaMed007 (Figure 3c) and Micro-bee injector (Figure 3d) were also established to take the responsibility for the diagnostic issues.



Figure 3 The character features of the ePS. (a) The example of the Heart Structure Investigation design of front page of the space city launched in the BlackBoard Learn; (b) the main character of Mrs Jackson who lived in the space city and went to the cardiovascular tower for the body check; (c) the door gate robot CaMed007 which help to scan the health status of Mrs Jackson; and (d) the vessel robot, Micro-bee injector was created for the diagnosis of the disorder of the blood vessels.

To gamify the quiz, we incorporate competitive interventions to increase students' engagement in the revision. The quiz was designed in the game format and students were instructed to find out the problems during the transmission of the health data for Mrs Jackson. Our team designed quiz questions in line with the course objectives. The gamified quizzes have been designed in the game format, i.e. "ERROR" gamification as shown in Figure 2 which has been categorised in three difficulty level to address varying students need in the revision: *Basic level* requires memorization of fundamental knowledge related to the cardiovascular system; *Advanced level* requires an understanding of the correlation with functions of the cardiovascular system; *Challenging level* requires a comprehensive understanding and application of pathological changes of the cardiovascular system. Students would be notified whether they answer the question correctly or incorrectly. We did not provide the answer to incorrect attempts so as to encourage students to revisit the courseware and solve the questions by themselves.



Figure 4 The elements of the ERROR gamification. (a) The front page design of the ERROR gamification was shown; (b) there are three gamified levels: sic advanced and challenging for the student to choose in participation of the gamification.

Table 2 shows the scoring mechanism in the quiz. Questions score 5, 6, and 9 points at the level of basic, advanced, and challenging, respectively. In each attempt, students could try five questions in each level at a time, and the total possible points are 100 if all questions are answered correctly. Students have unlimited attempts throughout the semester and, in each attempt, questions will be randomly selected from the question bank. The system would record the latest score only. Three book coupon awards were given to students who came out in the top three in the quiz by the end of the academic term.

Level	Number of questions in the bank	Points for each question	Total points at the level
Basic	> 100	5	25
Advanced	> 30	6	30
Challenging	> 20	9	45
	Total Poin	ts in each attempt:	100

#### **Table 2 Scoring Mechanism in the Quiz**

#### 3. Evaluation Plan

The three developed three micro-modules have been implemented into an e-learning platform with tracking function, e.g. Blackboard Learn systems in the first term of the academic year 2016/17. Moreover, the scrutiny of weblogs in tracking system has been retrieved at the end of the module teaching to monitor the usage of the developed micro-modules among students. Overall, the research design, methodology and timeline have been met the timeline in our proposal which was completed satisfactorily.

The ePS has been launched to the Blackboard Learn for the trial run starting from 15 Sep to 13 Dec, which was the first term of 2016-17 academic year to the course of Human Physiology and Anatomy for the fifty-three Pharmacy Year 2 students. The marks of continuous assessment were gained if the Pharmacy student accessed the ePS and submitted the e-questionnaire. From the tracking record of the LMS in Blackboard Learn, the students accessed the ePS on and off as shown in Figure 5.



#### Figure 5 Temporal Accesses to the Courseware

\*Indicates formative assessment date, which was on December 12, 2016. The solid-lined parenthesis indicates the teaching period of the cardiovascular system module. The first usage peak was noted in the first week of the module; the dotted-lined parenthesis indicates the second usage peak, which was on November 30, 2016, which was two weeks before the formative assessment.

With the Learning Management System, the score of each student who played the gamification at each level can be recorded. The weekly announcement of the "Winner of the week" of top three students for each micromodule as shown in Figure 5 which is an example was posted on the Blackboard Learn. In addition, we rewarded the winners with the book coupons to increase their interest and engagement.

Winners of the Week (2016.11.04) - Coronary Circulation Specialist



Figure 6 An example of the template for the weekly announcement of the winners of the week was showed.

For the feedback of the eighty e-questionnaires, the genders were 45% females and 55% males. Besides, we revealed that 50% students who had ever used the e-learning courseware before. The distribution of the health professional students to submit the feedback was shown in the Figure 7. There were 66.3% Pharmacy Year 2 students, 22.1% Biomedical Engineer Year 2 students, 9.3% Medical Year 1 Students and 2.3% of other Years from these Programmes. Since the pharmacy students were given marks to the formative assessment if they assessed the micro-modules. Moreover, they are the primary students who were eager to assess the micro-modules.



Figure 7. The pie chart showed the distribution of the health professional students for the survey.

The survey findings of the design feature of the three elements in micro-modules was summarised in Figure 8. The setup of the gamification was also concerned in this research as shown in Figure 9. Also, the general open question of "any other comments" was input at the end of the e-questionnaire. The pros and cons of the arguments for and against ePS were summarised in Figure 10.

Figure 8 Attitude towards the overall content and the design of the ePS.



Table 9Attitude towards the setup of the gamification



Figure 10 The pros and cons were collected from the students' their comment.

Pros	5	Con	IS
	The 360 degree images of heart are	-	the video is too brief if it is considered
	very useful in studying anatomy		as a tool for revision but having video
	especially for the spot test.		is good for visualizing the lecture
-	Viewing the structure of Heart is		content.
	useful.( Unlike the textbook, the courseware	-	it is too difficult to identify different
	can help me to know the real structure) The		vessels of heart from different
	quiz can help me to realize my understanding		directions of view and the micro
	of Cardiac part. I hope that other system such		module can't help with learning this
	as nervous system and respiratory system have		technique.
	the similar learning modules. Thank you so	_	the short movie clips can't be reversed
	much for making the courseware.		so it is difficult to go back and watch
_	More videos can be added into the courseware		again except restarting the clip from the
ŝ	it makes learning more interesting		beginning
2	this is a good courseware!	_	The number of questions of each stage
	more photos or pictures can be shown		can be increased to around 10.
	for clarification	_	Would be better to have explanation to
	It will help a lot if the software		answers
	including a 360 degree view of heart	—	The number of questions can be
	and blood vessels with real specimens		increased in each level.
	instead of only cartoons. Overall the	11 <u></u> 1	Studying the lecture notes is very
	software is very helpful		time-consuming already. So not much
	quite interesting		time left for using the ePS
-	User-friendly software	_	Each major should have different
-	It would be great if ePS is expanded to		questions since the depth of the
	other courses for self-directed learning		contents taught in lessons were
			different. To me the questions are too
			difficult and I have not even heard of
			some of the terms.

Table 5 show the courseware usage by the final examination result. Overall, the average courseware log-in rate was about 13 times per students. Students from A-range accessed ePS more often than other grade ranges, although the difference was not statistically significant (p=0.20). Further analysis identified five students attempted the ePS more than 20 times that far exceeded the class average (outliers); of which two students from A range attempted 45 and 55 times, two from C ranges who attempted 28 and 36 times, and one from F range who attempted 29 times. The outliers were then excluded in the further analysis. In the analysis excluding the outliers, the difference of courseware usage by exam performances was statistically significant (p=0.01).

	Inclusion of	Outliers			Exclusion of	Outliers		
Grade	No of	Mean Access	Б	n voluo	No of	Mean Access	Б	n voluo
Range	students	(SD)	Г	p- value	students	(SD)	Г	p- value
Α	18	17.44 (14.00)	6.02	0.20	16	13.37 (7.74)	3.75	0.01
В	17	10.18 (3.96)			17	10.18 (3.96)		
С	12	11.6 (10.51)			10	7.50 (4.50)		
D	3	5.67 (5.13)			3	5.67 (5.13)		
F	3	10.00 (16.46)			2	0.50 (0.71)		
Total	53	12.7 (10.8)			48	10.0 (6.30)		

Table 3. Access of ePS by Anatomy Course Examination

Overall, we provide an example to explore how the ePS is adopted in blended learning, from where our empirical data may provide evidence that ePS can stimulate students' learning performance.

The frequency to use the ePS during the academic term was also investigated. The result was indicated in Figure 8. There were 62.8% students who just used the ePS 1 to 2 times; 18.6% students who frequently to access the ePS; 4% students always played the ePS, and about 9.3% students used the ePS only before the examination. However, there were 4% students

who never accessed it. Interestingly, only four students were never using the ePS to assist their understanding in the studying of Anatomy but helped in this survey. Moreover, we further collected information whether they found the ePS was helpful in the study or not. The data of student response was analysed as shown in Figure 9. From the analysis, we revealed that only 2% of the students who found the ePS was not helpful at all. Students (over 97%) regarded the ePS was the courseware that facilitated their progress of learning of what they wanted. Our study also revealed that there would be a student demands in other courses such as Biochemistry and Physiology.



Figure 8. The frequency of the usage of ePS.



Figure 9. Helpfulness of ePS.

This study we provide an example to explore how the ePS is adopted in blended learning, from where our empirical data can provide evidence that ePS can stimulate the interest of students' self-paced learning.

#### 4. Dissemination, diffusion and impact

Our team has attended two international conferences, which were organised by the National University of Singapore and The Chinese University of Hong Kong. Indeed, the concept of ePS, which was recognised as our team, has been prized the 'Merit Award' (Appendix I) for the e-poster presentation (Appendix II) in the Singapore's conference. Our team also discussed with one of delegate at the conference, which is the Professor in Anatomy in Malaysia. She also regarded the concept of ePS is good as the ePS makes the learning process much interesting.

<u>PART II</u> <u>Financial data</u> Funds available: Funds awarded from MMCDG

\$ <u>102,523.70</u>

\$ NIL

Total: \$ 102,523.70

								Quotations/
			main					competitive
Item	Job Name	Job Description	hours	Unit Price		Total		bids
а	Storyand Storyboard Design	Prepare Storyboard, StoryDesign	20	HK\$ 18	0.00	HK\$	3,600.00	ITSC
b	Character Design	Design Robot and patient character for courseware	5	HK\$ 18	0.00	HK\$	900.00	ITSC
С	Scene Design	Scene Design for 3 coursevare	4	HK\$ 18	0.00	HK\$	720.00	ITSC
		Develop 3 courseware with Articulate Storyline 2,						
		question bank preparation and photo shooting						
d	Coursevare Development	specimen	90	HK\$ 18	0.00	HK\$	16,200.00	ITSC
е	Coursevare Launching	Prepare for launching courseware in Blackboard	4	HK\$ 18	0.00	HK\$	720.00	ITSC
f	Coursevare Revision	Coursevare revision for Trail Run	10	HK\$ 18	0.00	HK\$	1,800.00	ITSC
				Sub-total		HK\$	23,940.00	
	SMART image database (Online / Enost) for			HK\$ 10.3/	7 50	ни¢	10 3/17 50	
g	15 Apr 2016 - 17 Apr 2017 (USD2,500)	video clips development		1150 10,04		ΠNΦ	10,170,00	
	EndNote X7 Hybrid for Windows and Mac,							
	Single User Licence (ESD), Academic (SN			HK\$ 1,95	0.00			
h	2071719220)	Paper preparation: Reference editing	2			HK\$	3,900.00	
	Reimbursement for Mindjet MindManger -							
i	Licence and Upgrade Protection Plan 4 sets	Paper preparation: table editing	1			HK\$	3,391.20	
j	Content editing(Reimbursement)	Professional editing				HK\$	6,000.00	
k	Student helper (Reimbursement)	content development	37	HK\$ 5	5.00	HK\$	2,035.00	
				Sub-total		HK\$	34,673.70	
		Poster Design for T&L Expo 2016 in pdf Format (A3						
	ePS Expo Poster Design	size)	6	HK\$ 18	0.00	HK\$	1,080.00	ITSC
m	ePS ePoster for APMEC Conferen 2017	Poster Design for in pdf Format (16 : 9)	6	HK\$ 18	0.00	HK\$	1,080.00	ITSC
		1. Website & interaction Design						
		2. Graphic Design						
n	ePS Website Design & Development	3. Website Development	55	HK\$ 18	0.00	HK\$	9,900.00	ITSC
0	Final Report Chroma KeyVideo Recording	Rental fee and support for Chroma KeyStudio	10	HK\$ 34	0.00	HK\$	3,400.00	ITSC
		Video Editing for the Final Report with 1 revision						
р	Final Report Video Editing	editing	20	HK\$ 34	0.00	HK\$	6,800.00	ITSC
		3 MM courseware revision and update according to						
q	Courseware Revision	feedback	30	HK\$ 18	0.00	HK\$	5,400.00	ITSC
				Sub-total		HK\$	27,660.00	
	Othersexpenses							
r	Content editing(reserved)	Professional editing				HK\$	3,000.00	
s	Student helper (Reserved)	platform development	30	HK\$ 5	5.00	HK\$	1,650.00	
	conferences including local & non-local	Share the experience of the development of e-						
	expenses; Publication cost & other research	learning courseware with expertises; publish a	1			HK\$	11,600,00	
	expenses (service provided by the CUHK	paper in the international journal for the peer review						
t	units)	of new innovation of e-learning courseware						
				sub-total		HK\$	16,250.00	
				Total		HK\$	102,523.70	

#### Expenditure: The actual expenditure was attached in Appendix III for reference.

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#### PART III

#### Lessons learnt from the project

Blended learning which is a type of modern teaching is an innovative teaching approach, integrating traditional teaching with media-rich technology, where students can easily access to online e-learning materials before attending formal classroom teaching, tutorials or

practical. The unique integration of e-learning material has been found to effective in promoting teaching and learning in this study as the data shown that over 97% of students concurred the increase of effectiveness of ePS to their study. Of course, limited evidenced-based data supporting simulation-based micro-module can be upheld with the standard of medical education in our University.

To increase the self-driven stimulation learning, we may propose the strategic pedagogy should be a contemporary approach to the blended learning. Indeed, the contact hours in the timetable is fully occupied for each programme in Hong Kong tertiary education. Students normally regard the e-learning courseware is not the essential measure for knowledge acquisition as they usually are willing to have spoon-fed passive learning in the conventional In our study, we found that there are 50 % students who are the first time to use education. the e-learning courseware in learning Anatomy. We need to force students to revert their mindset that e-learning courseware is necessary for the continuous development of the competence of health professional training. Furthermore, we have adopted a new concept of the design that three essential elements were integrated into one platform. Furthermore, only about 2% of students did not think the ePS is not helpful, and therefore the hit rate was high for the duration of the topic of a cardiac vascular system for the anatomy and physiology teaching was about 10 hours. The data showed that the students liked to revisit the ePS from time to time; even before their examination. The ePS formed an excellent example of learning courseware to facilitate the students' learning.

In our Faculty of Medicine, there are a plastinated specimen for such purpose; but students only visit the dissection room within the assigned period during the office hours if they want to have a revision. From the data analyses, students agreed that the design of 360-degree photos presentation in the study-paced elements facilitate their understanding the relationship of the anatomical structures in the heart structure and coronary heart circulation. We recognise there is an advantage to shoot and reconstruct the 360-degree photos from the plastinated specimens instead of the illustrations or plastic models. Those plastinated specimens are suitable presented anatomical structures preserved which are in the three-dimensional reality viewing. Even though the plain illustrations and micrographs were developed for the self-paced study in the Histology of blood vessels of the micro-modules, about 93.75% students also found the content useful.

At the early beginning of the setup, we wanted to have the pilot study whether the gamification that is the integration of game element into the quiz for the self-refection can apply to the anatomy study in the health professional study to stimulate the engagement of e-learning courseware and build up the effective learning. We adopted the storytelling style to create the "Future Space City" and input different elements into three separate micro-modules. Indeed, we only chose the Cardiovascular system in the research study.

The narrative video is a short within 5 minute-length animation clip for an explanation of the subtopic of the teaching content. The dynamics of attentions spans for a student was only the first ten minutes of lecture. Besides, students like to have verbal linguistic, visual spatial and auditory-musical to motivate their intelligence learning process. From our data, more than 98.75% concurred that micro-modules are good.

There is not much well-established e-learning teaching courseware for health professional students to facilitate their learning in Hong Kong tertiary education. Overall, we can pay attentions to the findings as follows:

- This study provides an example for innovative pedagogy by using the concept of micro-modules in the discipline of Anatomy and Physiology
- This study presents an opportunity for teachers to explore different teaching

approach —from face-to-face teaching to e-learning approach in the integration of gamification.

- This study has been reported that it is a good model for the future development of a series of teaching materials related to basic clinical knowledge, which is essential for the health professional courses.
- The world is changing every day. Indeed, one of the most valuable assets for us is to know how to 'learn'. Our project is a pilot study to confirm that the gamify interaction can function as simulation-based learning activities in the self-reflection on the condition that the feedback should be in the immediate response. The study also provides an insight into the micro-modules work as facilitators, which strengthen teaching and learning qualities without barrier concern for the application of the blending learning approach. Our University may set the strategic goal in building a blended learning culture for laying the foundation for the twenty-one era teaching and learning.

#### PART IV

Information for public access

#### 1. Keywords

(Most relevant)	Keyword 1: Micro-modules
	Keyword 2: Gamification
	Keyword 3: Blended Learning
	Keyword 4: Health Profession Curriculum
(Least relevant)	Keyword 5: Teaching Anatomy

#### 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:**

If a publicly accessible project website has been constructed, please provide the URL.

*Only students can temporally access the URL for the pilot study as follows:* 

http://www.sbs.cuhk.edu.hk/undergraduate/eps/index.html

After the pilot study, the supplementary information for the preparation of slide was also constructed in the space city tower for students to access.

#### (b) Webpage(s):

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.



#### (c) Tools / Services:

If you have used any tools or services for the project, please provide names of the tools or services in here.

Tools and Service that we have chosen in the development of ePS are listed as follows:

- Microsoft PowerPoint 2010 for Storyboard production
- Adobe Illustration 2015 CC for Graphic Design & Illustration
- Adobe Photoshop 2015 CC for photography retouch
- Camtasia Studio 8 for video editing
- Articulate Storyline 2 for courseware production
- EBSCOHost Scientific & Medical ART (SMART) Imagebase for professional knowledge video assets, <u>http://ebsco.smartimagebase.com/</u>
- Shutterstock illustration for assets of courseware, https://www.shutterstock.com/
- Information and Technology Service Centre, CUHK

#### (d) Pedagogical Uses:

The micro-modules have been upload to the Blackboard Learn one week in advance and requested Pharmacy students to surf, watch and play ePS. The LMS was the good resource for our team to track the students' activities.

#### 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/</u> <u>Target Students</u>	<u>Term &amp;</u> <u>Year of</u> <u>offering</u>	Appro No stud	<u>ximate</u> . of ents	<u>Platform</u>
<ul> <li>PHAR1432/Pharmacy students</li> <li>SBMS1431/Biomedical Engineering</li> </ul>	1 <sup>st</sup> term 2016	5	5 5	Blackboard
<ul> <li>Medical Students</li> <li>Chinese Medicine Students</li> </ul>		20 3	00 0	
Table 3: Presentation (if any)		<u></u>		
Please classify each of the (oral/poster) press only one of the following categories	entations into o	one and	Nı	umber
(a) In workshop/retreat within your unit faculty)	(e.g. departmen	t,		NA
(b) In workshop/retreat organized for CUHK workshop, workshop organized by other CU	C teachers (e.g. C HK units)	CLEAR		NA
(b) In CUHK ExPo jointly organized by CL	EAR and ITSC		1 Day	event, 15 Dec., 2016
The Pilot Study on the e-Professional Teaching Anatomy and Physiology: I Approach for the Health Professional of Medicine, T & L Innovative Expo	l Study (ePS) in Blended Learnir l Education in F , CUHK	ng Faculty		
(d) In any other event held in HK (e.g. UGC delivered to units of other institutions)	symposium, tal	lks	Plea	ase insert no
(e) In international conference Oral Presentation			2-Da	y Event, 9-10 March
Are Micro-Modules Applicable in Anato Health Professional Education? 1 <sup>st</sup> Me Conference, The Chinese University of	omy Teaching fo edical Educatior Hong Kong	Dr 1		
(f) Others (please specify)			3-Day	Event, 7-9 April
Oral Presentation				
"Integration of Microlecture and Gamification Teaching for the Health Professional Educate Medical Education Conference (IMEC 2017	on in Anatomy ion", 12 <sup>th</sup> Intern ), Malaysia	ational		

 Table 4: Publication (if any)

Please classify each piece of publications into one and only one of the following categories	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	
<ul> <li>Title: The pilot Study on the E-Professional Study (ePS) in Teaching Anatomy and Physiology: blended Learning Approach for the Health Professional education in Faculty of Medicine</li> <li>Publisher: 14<sup>th</sup> Asia Pacific Medical Education Conference – from Globalisation of Education to Global Healthcare Handbook</li> </ul>	E-Poster Presentation Session 2, p. 334
(e) Conference proceeding	NA
e-Poster Presentation	
The pilot Study on the E-Professional Study (ePS) in Teaching Anatomy and Physiology: blended Learning Approach for the Health Professional education in Faculty of Medicine,	
14 <sup>th</sup> Asia Pacific Medical Education Conference – from Globalisation of Education to Global Healthcare, Singapore.	
Our team has been prized the "Merit Award" (Appendix I) in this presentation and the Certificate was attached for the reference.	
(f) A chapter in a book accessible internationally	NA
(g) A paper in a referred journal	submitted & in process
Our team has submitted a paper to the international referred journal, Health Professions Education for publication and the title of paper is as listed:	
Tang MK, Olivia MY Ng, Aden Chan, Taylor Tang, Daisy Chen (2017) Blended Learning in Anatomy Teaching for Non-medical Students: An Innovative Approach to the Health Professions Education	
(h) Others (please specify)	NA

Remarks: NA – Not Applicable

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

Anatomy is a fundamental knowledge in Health Professional's training curriculum. A new pilot study electronic learning (eLearning) micro-modules entitled ePS (electronic Professional Study), which is only comprised of cardiovascular system has been developed. In its context, there were three main components; narrative microlecutres, self-paced study and gamified interaction quizzes. While implementation of gamified element, a storyline is used to merge into the learning materials with virtual interactions under the theme of a future space city. More importantly, gamification design has been created a fun and reward interpersonal learning experience, which facilitates cognitive learning.

The trial version of ePS was successfully launched in Blackboard Learn, where access is available to students from Pharmacy curricula in their Year 2 for the research study; other students of Biomedical Engineering Year 2, Chinese Medicine Year 2 and Medical Year 1 are only invited for the survey. To find out the students' opinion about the courseware, we collected feedback via e-submission. The respondents agreed that those component approach adopted by ePS was an interesting way to study the cardiovascular system, and it helped reinforce the knowledge gained.

Overall, 97% students concurred that ePS could facilitate their understanding in Anatomy because of its active learning approach. This study has been reported that the elements of verbal linguistic learning, visual-spatial driven study the gamified included in ePS can easily be applied in Anatomy as well as other science-related learning and teaching in the Faculty of Medicine.



Centre for Medical Education Yong Loo Lin School of Medicine



## E-Poster Presentation (Merit Award)

awarded to

# Dr. Tang Mei Kuen

14th Asia Pacific Medical Education Conference (APMEC) on 13 & 14 January 2017

Dr Dujeepa D Samarasekera Director, Centre for Medical Education Yong Loo Lin School of Medicine National University of Singapore

Appendix I

### Appendix II

1

Contact Dr. Florence MK Tang | florencetang@cuhk.edu.hk

1-00

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Project ID : 3210767 Responsible Cost Cent. Responsible Person	re : SBS : TANG Mei Kuen		THE CHINESE INCOME AND FROM 01.	UNIVERSITY OF H EXPENDITURE ST. 07.16 TO 31.0	NIG KONG ATEMENT 3.17		Date Time	31.03.17 16:21:36	Page ZJIE0300 /	09934M	-
Bursary Contact Perso Start date : 03,02,16	n : Karen/Carmen Lam End date : 31,03,17	В. Of	Pilot Study (ePS) Lended Learning Ap	of the Micro-Mo proach for the 1	iules in Teaching An Health Professional	atomy and Physic Education inFact	alogy: alty				
				Year	-to-date						
		Balance at b/f	Actual payment	Commitment	Outstanding PR	Total	Balance	Budge	et II	Available udget Balan	e
SELECTION OPTIONS											
Project definition :											
WBS Element : EQUAL	3210767	INCLUSIVE									
Level : Between	1 AND 99	INCLUSIVE									
Incl. Hierarchy : Yes											
Current data											
Fiscal year	2017										
Period	60										
Proten image											
Fiscal year											
Period											
Budget year											
Budget version											
Summary	NO										
Cost element group	ZJIVC2. TDG										
Subtotal at level	01										
WBS element status se	lection: Active and blocked										
Blocked date : BETWEEN	01.01.1900 AND 31.12.9999	INCLUSIVE									
*** Please note that	the 'Suppress' flag must be set	to 'X' in all 'INC	XME' levels of the	. cost element g	roup specified.						

Project ID : 3210767 Responsible Cost Centre : SBS Responsible Person : TANG Mei Kuen		THE CHINESE INCOME ANI FROM 01	UNIVERSITY OF H D EXPENDITURE ST .07.16 TO 31.0	ONG KONG ATEMENT 3,17		Date Time	31.03.17 16:21:36	Page ZJIE0300	/ 09934M
bursary concact rerson : Mareu/Janmen Lam Start date : 03.02.16 End date : 31.03.17	<u>й</u> о	-Pilot Study (ePS) 31ended Learning A E Medicine	of the Micro-Mo pproach for the	dules in Teaching A Health Professional	natomy and Physic Education inFacu	ology: ilty			
			Year	-to-date			- 5	13	
	Balance at b/f	Actual payment	Commitment	Outstanding PR	Total	Accumutated Balance	Budg	att	Available Budget Balance
Expenditure		and a second at	Allon Allon						umoones. oomooden samesoore
Computer Software & Maint.	23,257.50	3,931.20	0,00	0,00	3,931.20	27,188.71		0,00	(27,188.70)
Teaching & Research Expenses	0,00	00.00	0,00	0.00	0,00	0.0	102	,838,00	102,838.00
Service Charges	87.00	60,904.54	0.00	00.00	60,904.54	60,991.5	-	0,00	(60,991.54)
Overseas Travel	0.00	9,915.92	0.00	0,00	9,915.92	9,915.9	~	0,00	(9,915.92)
Other Expenses	0.00	2,035.00	0,00	0.00	2,035.00	2,035.01	0	0,00	(2,035.00)
	23,344.50	76,786.66	00.00	00.00	76,786.66	100,131.1	102	, 838, 00	2,706.84
Total Expenditure	23,344.50	76, 786.66	0.00	0010	76,786.66	100,131.1	102	,838.00	2,706.84
TOTAL FUND BALANCES	(23,344.50)	(76,786.66)	0.00	0,00	(76,786.66)	(100,131.1	(102	:,838.00)	
The commitment includes the staff cost commitment	: for three years or u	p to the employmen'	t contract end d	ate. The budget hol	der is responsibl	e to solicit :	funds from	other sour	ces

The commitment includes the staff cost commitment for three years or up to the employment contract end date. The budget hole to cover any deficit of the project, taking into account any approved budget to be released to the project in future years.