

THE CHINESE UNIVERSITY OF HONG KONG

Micro-Module Courseware Development Grant

Scheme 2: Studies in Foundation Courses

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: [Building Whiteboard Animations for Flipped Classroom in GEF Courses](#)

Principal supervisor: [Dr. Li Ming Kenneth](#)

Co-supervisor(s): [Dr. Lai Chi Wai Kevin](#), [Dr. Szeto Wai Man](#) and [Dr. Wong Bon Wah Baldwin](#)

Department / Unit: [Office of University General Education](#)

Project duration: From May 2017 to April 2018

Date report submitted: [30 April 2018](#)

1. Project objectives

Is the project on track to meet its objectives?

Have the objectives been changed as a result of the experience of working on your MMCDG project?

The objective of this project is to develop micro-modules to flip the classrooms of UGFN1000 In Dialogue with Nature (UGFN for short) and UGFH1000 In Dialogue with Humanity (UGFH for short) using short whiteboard animations. The project is on track to meet this objective. Two micro-modules, namely “Origin of Species” and “Ideal Society” were developed. Each of them consists of two short whiteboard animations.

2. Process, outcomes or deliverables

Please specify the number of micro modules produced, and the course(s) (with course codes and titles) that have used the micro modules in Part IV, and provide more detailed descriptions here. Must specify duration of each micro-modules (in terms of students online contact hours), total duration time of all deliverables and style. (With reference to the “Summary of video presentation styles” developed by CLEAR)

Has the nature of the deliverables been changed?

Have you adjusted your timeline?

Overall, was the project completed satisfactorily?

One micro-module, “Origin of Species”, was developed to flip the classrooms of UGFN1000 In Dialogue with Nature. It consists of the two short whiteboard animations “Are transformation and evolution different” (Cantonese: 4 min 34 sec; English: 5 min 09 sec) and “What is the origin of species?” (Cantonese: 6 min 11 sec; English: 5 min 37 sec)

Another micro-module, “Ideal Society”, was developed to flip the classrooms of UGFH1000 In Dialogue with Humanity. It consists of the two short whiteboard animations “Why do we obey the laws” (Cantonese: 4 min 54 sec; English: 5 min 31 sec) and “What is socialism?” (Cantonese: 5 min 31 sec; English: 5 min 59 sec) These deliverables are now available on YouTube. The nature of deliverables and the timeline of this project have not been adjusted. In general, the project was completed satisfactorily.

Micro-module for UGFN – “Origin of Species”

FN-1 “Are transformation and evolution different?”

- Cantonese (4:34): <https://youtu.be/tCNCQx191RA>
- English (5:09): <https://youtu.be/yO0XovtqCOK>

FN-2 “What is the origin of species?”

- Cantonese (6:11): <https://youtu.be/zbAf32rL2Ls>
- English (5:37): <https://youtu.be/6KXeRpJZgVg>

Micro-module for UGFH – “Ideal Society”

FH-1 “Why do we obey the laws?”

- Cantonese (4:34): <https://youtu.be/5si8oy1sLXI>
- English (5:31): <https://youtu.be/sBU71uBFB14>

FH-2 “What is socialism?”

- Cantonese (5:31): <https://youtu.be/dLdPdZqU7Cw>
- English (5:59): <https://youtu.be/mxGhS0SsbaM>

3. Evaluation Plan

Have you altered your evaluation plans?

What monitoring data did you collect?

Does your evaluation indicate that you have achieved your objectives?

Our evaluation plan was not altered. It consists of two surveys.

Survey 1:

There were quiz surveys conducted before concerned tutorial classes. It aimed to evaluate the effectiveness of the whiteboard animations on equipping students with the prerequisite knowledge before tutorials. Students were asked to answer two multiple-choice questions for each animation. These questions tested students’ understanding of the prerequisite knowledge covered in the animations. In general, students who watched the animations performed much better than those who did not watch (Table 1). The data suggested that the animations are effective to equip students with the prerequisite knowledge for discussion before tutorials.

Table 1 Students' performance in quizzes in survey 1

	UGFN - "Origin of Species"				UGFH - "Ideal Society"			
	FN-1		FN-2		FH-1		FH-2	
	Watched	Not watched	Watched	Not watched	Watched	Not watched	Watched	Not watched
All wrong (%)	8.7	38.4	4.9	24.2	24.1	50.0	9.9	69.2
One correct (%)	88.0	58.2	38.5	51.6	42.6	46.2	23.9	20.5
All correct (%)	3.3	3.4	56.6	24.2	33.3	3.8	66.2	10.3

Survey 2:

This was a questionnaire survey conducted at the end of the tutorials classes. It aimed to assess to what extent the animations have improved students' preparation for the tutorial discussion and enhanced their motivation for studying the course. A total of 430 surveys were collected. The results showed that 62% respondents watched at least one of the whiteboard animations (Table 2).

Table 2 The rate of watching of the four animations.

Course Animation	UGFN		UGFH	
	FN-1	FN-2	FH-1	FH-2
No. of respondent	311	313	109	108
Watched (%)	64.3	62.0	68.8	64.8
Not watched (%)	35.7	38.0	31.2	35.2

Our data showed that showed that 85% students agreed (slightly agreed, agreed, and strongly agreed) whiteboard animation is more appealing than lecture recording and 90% students agreed the animations raise their interest in the discussed topic (Table 3). Over 90% students agreed that the animations are helpful for their understanding of the texts, clarifying the concepts and providing knowledge before tutorial classes (Table 3). There were 87% students thought these animations are helpful for the discussion during tutorials and 87% students agreed they are helpful in reflecting on topics related to multiple texts (Table 3). About 92% students thought the level of difficulty of these animations is appropriate (Table 3). In general, a total of 96% students were satisfied with the animations. All these encouraging results indicated that the whiteboard animations had improved students' preparation for the tutorial discussion and enhanced their motivation for studying the course.

Table 3 Feedback of the whiteboard animations in the questionnaire survey from 430 students.

	Strongly disagree <--> Strongly agree					
	1	2	3	4	5	6
Compared to video lecture, whiteboard animations are more appealing	0.6	3.2	10.8	36.3	36.8	12.3
The animations make me more interested in the topic	0.6	2.6	7.3	34.8	42.4	12.3
The animations help me understand the text	0.3	1.5	7.6	29.8	42.1	18.7
The animations help clarify relevant concepts	0.3	1.2	5.8	27.2	49.1	16.4
The animations help me understand the prerequisite knowledge before going to tutorials	0.0	2.0	7.9	33.9	44.4	11.7
The animations help me in the discussions during tutorials	0.0	2.0	10.5	37.4	40.6	9.4
The animations help me reflect on topics related to multiple texts	0.0	2.3	10.8	37.7	38.9	10.2
The animations are of the right level of difficulty	0.3	0.9	6.5	23.5	49.7	19.1
I am satisfied with the animations overall	0.0	0.6	3.0	26.3	51.2	18.9

A 6-point Likert- scale is used to indicate the degree of agreement on the statements. (1: strongly disagree; 2: disagree; 3: slightly disagree; 4: slightly agree; 5: agree; 6: strongly agree). The figures are in percentage.

4. Dissemination, diffusion and impact

Please provide examples of dissemination: website, presentations in workshops or conferences, or publications.

Please provide examples of diffusion: how the project results/process/outcomes/deliverables have been used in your unit and other parts of CUHK or other institutions?

Please provide examples of impact: how the project results (micro modules) can be adapted to other disciplines.

The two micro-modules were used in the classes of the four project members (500 students) in the second semester in 2017-18. This project was presented in Teaching and Learning Innovation Expo in CUHK on 7th December 2017. These micro-modules are now available on YouTube, and they will be used in all the classes of UGFN and UGFH (3800 students per semester) starting from the first semester in 2018-19. The technical skills for whiteboard animation production will be adopted to produce whiteboard animations on other topics to further enhance teaching and learning of UGFN and UGFH in the future. Our team's work of producing whiteboard animations has been published as a chapter titled "Whiteboard Animation: An Innovative Teaching and Learning Tool for Flipped Classrooms" in the book *New Innovations in Teaching and Learning in Higher Education* in 2017. We will present the finding in this project in conferences and publish the results in papers.

PART II

Financial data

Funds available:

Funds awarded from MMCDG	\$ 99,800
Funds secured from other sources (please specify _____)	\$ Nil
Total:	\$ 99,800

Expenditure:

Item	Budget as per application	Expenditure	Balance
Sparkol VideoScribe Software license (for animation production)	\$11,000.00	\$19,777.64	-\$8,777.64)
Adobe Creative Cloud Software (for designing graphics and illustrations)	\$12,000.00	\$8,208.00	\$3,792.00
AudioBlocks (for background music	\$1,000.00	\$2,400.00	-\$1,400.00

library)			
Artwork by freelance artist (for a 5-min whiteboard animation)	\$40,000.00	\$40,000.00	\$0.00
Voice-over by professional voice talents (for voice-over recordings)	\$27,000.00	\$11,967.60	\$15,032.40
Student helpers	\$8,800.00	\$5,494.50	\$3,305.50
Total:	\$99,800.00	\$87,847.74	\$11,952.26

PART III

Lessons learnt from the project

Please describe your way forward.

Please describe any of the following item(s) accordingly:

- *Key success factors, if any*
- *Difficulties encountered and remedial actions taken, if any*
- *The role of other units in providing support, if any*
- *Suggestions to CUHK, if any*
 - *Example: what should be done differently?*

The feedback from students is encouraging. We will produce more short whiteboard animations for these two courses.

This project developed two micro-modules to flip the classrooms of UGFN and UGFH. Using tailor-made short whiteboard animation is one of the key success factors for this project. To tailor-make the micro-modules, it is important to identify accurately the prerequisite knowledge for students to have an in-depth discussion. The animations are better to be student-centered. Identifying their common misconceptions is important for storyboard design. It is also good to include daily examples in the storyboard to make the story more interesting and engaging. The animations should be less than five minutes in length. It is very challenging to integrate all the contents in a five-minute story. Balancing the coverage, depth, precision, accuracy, and level of difficulty remains a difficult task.

Apart from storyboard design, illustrations and graphics design are the key success factors in this project. A helpful freelance artist is important. Another key success factor is the post-production. The tasks of the post-production included editing the animation and voice-over, adding background music and subtitles. These works are not difficult, but it is quite time-consuming. Hiring freelance voice-artists are very cost-effective. Student helpers skillful in doing the post-production work are essential.

PART IV

Information for public access

Summary information and brief write-ups of individual projects will be uploaded to a publicly

accessible CUHK MMCDG 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 most relevant to your project to least relevant) to describe your micro-modules/pedagogies adopted.

- (Most relevant) Keyword 1: Whiteboard Animation
 Keyword 2: Flipped Classroom
 Keyword 3: In Dialogue with Nature
 Keyword 4: In Dialogue with Humanity

(Least relevant) Keyword 5: General Education Foundation Programme

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.

(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) here.

Micro-module for UGFN – “Origin of Species”

FN-1 “Are transformation and evolution different?”

- Cantonese (4:34): <https://youtu.be/tCNCQx191RA>
- English (5:09): <https://youtu.be/y00XovtqCOK>

FN-2 “What is the origin of species?”

- Cantonese (6:11): <https://youtu.be/zbAf32rL2Ls>
- English (5:37): <https://youtu.be/6KXeRpJZgVg>

Micro-module for UGFH – “Ideal Society”

FH-1 “Why do we obey the laws?”

- Cantonese (4:34): <https://youtu.be/5si8oy1sLXI>
- English (5:31): <https://youtu.be/sBU71uBFB14>

FH-2 “What is socialism?”

- Cantonese (5:31): <https://youtu.be/dLdPdZqU7Cw>
- English (5:59): <https://youtu.be/mxGhS0SsbaM>

(c) Tools / Services:

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

The illustrations and graphics were designed by the team members and a freelance artist using Adobe® Creative Cloud™. Whiteboard animations were created using Sparkol VideoScribe. Background music was purchased from AudioBlocks.com. The animations were edited with CyberLink PowerDirector 13.

(d) Pedagogical Uses:

If any flipped classroom activities have been conducted, please provide information in here. If relevant, please indicate how your project output can be used to support flipped classroom activities.

Two micro-modules were developed to flip the classroom of UGFN and UGFH by using short whiteboard animations. Students were encouraged to watch the whiteboard animations to acquire the prerequisite knowledge and clarify conceptions before attending tutorial classes. Hence, more time could be spent for an in-depth discussion of the cross-text central issues in the interactive tutorial classes.

(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>
UGFN1000 classes L, W and Z	2 nd term 2017-18, year 1 and 2 students	375	YouTube
UGFH1000 class B	2 nd term 2017-18, year 1 and 2 students	125	YouTube

Table 3: Presentation (if any)

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)

Number

Please insert no

(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	1
(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>

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>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	1
(g) A paper in a referred journal	<i>Please insert no</i>
(h) Others (please specify) Short whiteboard animations published on YouTube	8

3. A one-page brief write up

Please provide a one-page brief write-up of no more than 500 words and a short video.

UGFN1000 In Dialogue with Nature and UGFH1000 In Dialogue with Humanity are foundation courses for all undergraduates. Students are required to read core texts before attending interactive tutorials to discuss some enduring questions about nature and humanity. In our experience, students are interested in reflecting on these questions. However, many of them find it difficult to have an in-depth discussion. This is mainly because they lack the prerequisite knowledge beyond the texts; they misunderstand the concepts; or they have an inadequate comprehension of abstract ideas and are unable to connect different texts.

In view of this, we have developed two micro-modules in this project to provide eLearning supplements for better learning and teaching. The micro-module, “Origin of Species”, was developed to flip the classrooms of UGFN. It consists of the two short whiteboard animations “Are transformation and evolution different?” and “What is the origin of species?” Another micro-module, “Ideal Society”, was developed to flip the classrooms of UGFH. It consists of the two short whiteboard animations “Why do we obey the laws?” and “What is socialism?” These animations have been tailor-made to explain essential knowledge and to clarify misconceptions that might arise. Instead of conventional video recordings of short lectures, whiteboard animations have been created to enrich the students’ learning experience. These consist of step-by-step illustrations with voiceover narrations to explain complicated and abstract ideas in an attractive and enjoyable way. The micro-modules are available online for students’ self-paced learning.

The micro-modules were used in the four UGFN and UGFH classes of the project members, which had 500 students, in the second term of the 2017-18 academic year. The effectiveness of the micro-modules was assessed by quiz and questionnaire surveys. According to the questionnaire survey, over 85% students agreed that whiteboard animations are more appealing than lecture recording and they raised students’ interest in the tutorial discussion. The quiz survey suggested that the animations are effective to equip students with the prerequisite knowledge before tutorial classes. This aligned with the questionnaire survey that over 90% students agreed the animations are helpful for their understanding of the texts, clarifying concepts and gaining knowledge before tutorials. In general, more than 96% students were satisfied with these animations. The results are encouraging.

The micro-modules will be full-launched to be used in all UGFN and UGFH classes starting from the first term of the 2018-19 academic year. Approximately 3800 students per term will be benefited from the micro-modules. In order to further enhance teaching and learning of UGFN and UGFH, more micro-modules with whiteboard animations will be developed in the future. At last, we would like to thank the IT Governance Committee for the generous financial support. We would also like to thank Office of University General Education for its support.

Short video:

https://gocuhk-my.sharepoint.com/:v/g/personal/liming_cuhk_edu_hk/Eapo684vcV5PrvXwHYTKINsByKKBK8TiN_H6c3FlbBchLvQ?e=bCnz33