

THE CHINESE UNIVERSITY OF HONG KONG

Micro-Module Courseware Development Grant

Scheme 1: Basic Scheme

Final Report (2017-18)

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: Using Flipped Learning to Understand Market Competition

Principal supervisor: Dr. KU, Fred K.T

Co-supervisor(s)

Department / Unit: Department of Decision Sciences and Managerial Economics

Project duration: From December 2017 to October 2018

Date report submitted: 31 Oct 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?

This project aims to enhance students' understanding of competition between firms using the flipped classroom approach. There is no change in the project objectives.

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?

Six micro-modules have been produced, including five teaching animation and one online classroom game. The micro-modules were used in DSME4040 Managerial Economics.

Teaching Animation	Length / Contact Hours	Style
--------------------	------------------------	-------

1. Intro - Business Competition Simulation Game	3:58	S2, S5, and S12
2. Monopoly	9:07	S2, S5, and S12
3. Cournot Competition	10:51	S2, S5, and S12
4. Stackelberg Competition	10:32	S2, S5, and S12
5. The Competition Game	5:32	S2, S5, and S12
Total online contact time	About 40 mins (students are expected to spend in total 1 hour for self-learning, including reading related materials)	
Online Classroom Game	130 mins, including classroom play time and debriefing	

There is no change in the nature of the deliverables. The project is completed satisfactorily.

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?

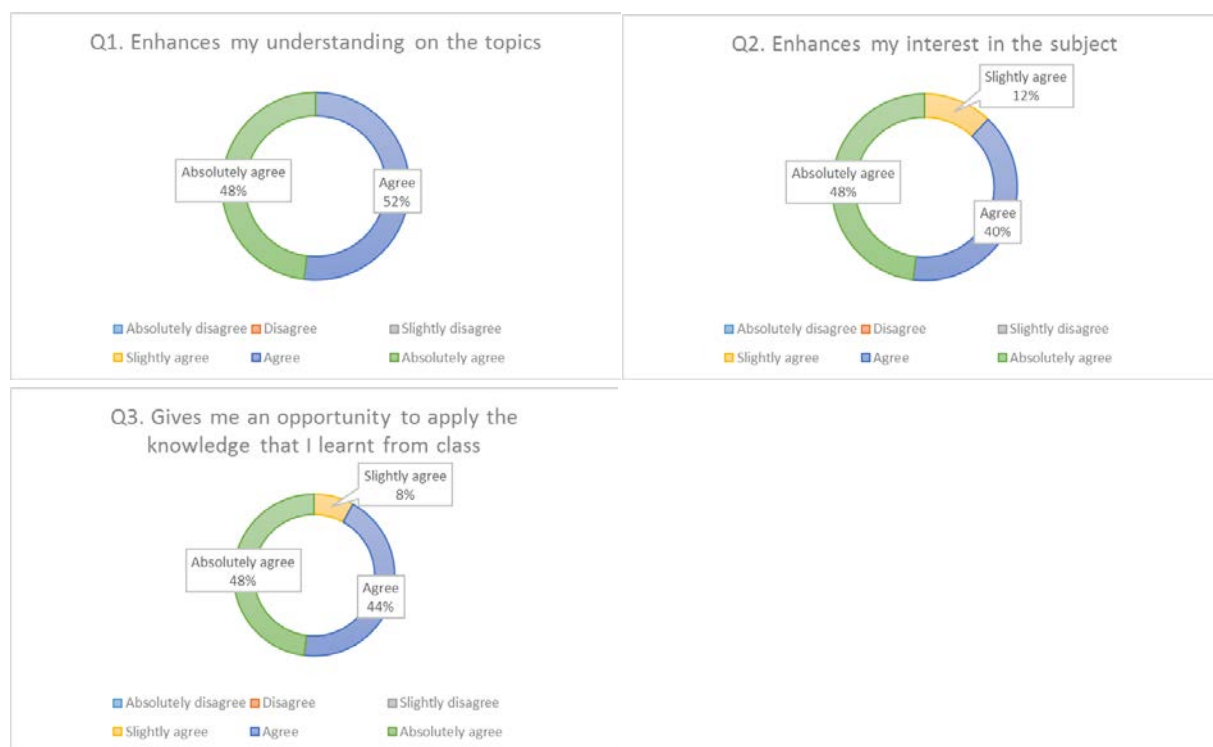
There is no change in the evaluation plan. We collected feedback from students using paper-based questionnaires. There were in total 25 questionnaires being collected, and students filled in the questionnaire anonymously.

Six questions were being asked in the questionnaire, and the first 3 questions used a scale of 1-6, with 1 = absolutely disagree, and 6 = absolutely agree.

1. Enhances my understanding on the topics (oligopoly competition, strategic interaction, collusion).
2. Enhances my interest in the subject.
3. Gives me an opportunity to apply the knowledge that I learnt from class.
4. How do you apply this experience in your future career (e.g., if you become a strategist)
5. How can this game be improved further?
6. Any other thing that you would like to share.

The graphs below summarize students' feedback for Q1 to Q3. In general the project is very well received by students, with 48% of students strongly agree that both their interest and

understanding on the topics were enhanced, and that the classroom activity gave them an opportunity to apply the knowledge.



There were also good comments provided by students via qualitative questions (Q4 – 6). Here're some representative comments:

“The game certainly serves the purpose of helping me understand more the course content”

“It makes me realize the real decision-making process is much more complicated (than the textbook situation)”

“I will know how to react and compete with my competitors under Cournot conditions”

“More conscious in the behavior of competitors in the market”

“The game has shown many unpredictable and interesting phenomenon that we may actually face in reality. Such an understanding can help me to get prepared for the future challenges as I will know that nothing could be well predicted without paying any actually cost.”

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 teaching animations have been uploaded to YouTube and shared with the general public

1. Intro - Business Competition Simulation Game
 - <https://youtu.be/spfwtGoHdKM>
2. Monopoly
 - https://youtu.be/K_zAesj7ZE8
3. Cournot Competition
 - <https://youtu.be/TjzXRiseuM0>
4. Stackelberg Competition
 - <https://youtu.be/eoF4c1Y9aEM>
5. The Competition Game
 - <https://youtu.be/IElq6bWlhrY>

The pilot of project was presented in a conference *Redesigning Student Learning Experience in Higher Education* organized by Higher Education Research and Development Society of Australasia (HERDSA) in 2017, and a conference proceeding was published in the e-Journal.

We have also applied to do a poster presentation in the coming Teaching and Learning Innovation Expo 2018 jointly organised by Centre for Learning Enhanced And Research (CLEAR) and Information Technology Services Centre (ITSC). In the presentation we are going to present our model, share with audience our teaching animations and online game, and report the feedback from students. These will certainly shed light on how to successful implement flipped learning strategy using animation and online classroom game.

PART II

Financial data

Funds available:

Funds awarded from MMCDG	\$ 99,000
Funds secured from other sources (Department surplus fund)	\$ 0

Total: \$ \$99,000

Expenditure:

Item	Budget as per application	Expenditure	Balance
Video production	\$75,000	\$75,000	0
Interactive simulation game	\$20,000	\$26,908	(\$6,908)
Student helpers	\$2,000	\$2,000	0
General expenses	\$2,000	\$1,825.4	174.6
Total:	\$99,000	\$105,733.4	(6,733.4)*

*The deficit will be supported by the department surplus fund

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 project sheds light on the further development and implementation of the flipped learning strategy. No doubt the design of pre-class self-learning materials are vital to the success of the new learning strategy, the plan and implementation of the classroom activities are of equally importance. In this project students first learned the complicated economic models via teaching animations, which primarily focused on the mathematical aspects of the models. And when they come to class, they formed teams and played against each other in an internet-based interactive classroom game, with the objective of maximizing the profit of their own firms. Finally a debriefing was hold to help consolidation their learning.

Judging from the feedback from students, the animation and the game were well-received. While the animations are deemed clear and useful to help students learn, we did received some constructive comments for the game. We will further improve the design and implementation of the game based on the past experience and students' comments.

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: Flipped Classroom

Keyword 2: Interactive Classroom Game

Keyword 3: Strategic Interaction

Keyword 4: Oligopoly Markets

(Least relevant) Keyword 5: Market Competition

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:

A YouTube play list is constructed:

<https://www.youtube.com/playlist?list=PLCC1x1H553rdIL0i8PtrQge80c2IZC-wv>

Business Competition Simulation Game:

<https://cuhklearningplatform.herokuapp.com/>

(b) Webpage(s):

Nil

(c) Tools / Services:

Nil

(d) Pedagogical Uses:

Flipped classroom has been used. Students learn the concepts and study the model before they come to class with the support of teaching animation. Using the knowledge learnt, they play the role of managers of firms that are competing with each other in the Business Competition Simulation Game. After the game there is a debriefing session that helps students to consolidate their 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>
DSME4040	2 nd term 2017	50	YouTube
DSME4110	1 st term 2017	50	YouTube
IBBA students majoring in Business Economics		30	YouTube

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)	<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	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	1 (Another one is expected in 2019)
(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	1 (Another one is expected in 2019)
(f) A chapter in a book accessible internationally	<i>Please insert no</i>
(g) A paper in a referred journal	<i>Please insert no</i>
(h) Others (please specify)	<i>Please insert no</i>

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.

This project aims to enhance students' understanding of competition between firms using the flipped classroom approach. No doubt, eLearning is an effective teaching and learning approach, especially in courses with large enrolment and students from diverse background who have different learning needs. With the advancement of information technology, students can learn the basic content by watching video lectures and the precious class time can be used for activities that foster interaction and higher-order thinking.

Five micro-modules in the form of teaching animation are produced. They provide a conceptual framework and mathematical analyses for various aspects of competition between firms, such as the idea of imperfect market competition, oligopoly, strategic interaction and strategic moves.

While it is vital to support student's self-learning, it is equally important to facilitate high quality learning in the face-to-face class time. Thus, an interactive simulation game which is played during class time is developed. Guided by the lecturer, students are provided with a perfect opportunity to 'live' the strategy that they learnt in the teaching animations. Students apply the knowledge on strategic interactions between firms during the game when playing against each other, including forming expectation on each other's strategy choice, deriving optimal strategy, engaging in collusive behaviors, and considering other possible strategic moves, etc. After the in-class game, there is a debriefing session led by the lecturer to summarize and highlight the key take-away points.

Through the videos and interactive simulation game under the guidance of the lecturer, students not only understand the core concepts in market competition; but also learn how

to apply the knowledge to analyze related issues in the real world.

The teaching animation and simulation game were used in DSME4040 Managerial Economics class in 2017 – 18. Student's feedback were collected and analysed. In general the project is very well received by students, with 100% of students agreed that this flipped classroom strategy with simulation game enhanced their understanding on the topics. 88% of students strongly agree or agree that it aroused their interest in the subject, and 92% of students strongly agree or agree that the classroom activity gave them an opportunity to apply the knowledge. Some highlight of students' comments:

“The game certainly serves the purpose of helping me understand more the course content”

“It makes me realize the real decision-making process is much more complicated (than the textbook situation)”

“The game has shown many unpredictable and interesting phenomenon that we may actually face in reality. Such an understanding can help me to get prepared for the future challenges as I will know that nothing could be well predicted without paying any actually cost.”