

**THE CHINESE UNIVERSITY OF HONG KONG**

**Courseware Development Grant (2016-17)**

**Final Report**

Report due 31 January 2018

Please return by email to Judy Lo judyl@itsc.cuhk.edu.hk

**PART I**

Project title: Adaptation of a simulation video game to enhance students' achievement of learning outcomes in GEF

Principal supervisor: KIANG Kai Ming

Co-supervisor(s): WONG Bon Wah Baldwin, LEUNG Mei Yee, CHEUNG Kam-ching, Leo

Department / Unit: Office of University General Education

Project duration: From February 2017 to January 2018

Date report submitted:

**1. Project objectives**

The project has achieved the aim to adapt a selected commercial game to facilitate students to study the General Education Foundation (GEF) Programme. The objectives have not been changed.

**2. Process, outcomes or deliverables**

Overall, the project has completed satisfactorily. The deliverable of this project is the enhanced version of the commercial game *Civilization* that is suitable for the students to use in the two foundation courses In Dialogue with Nature UGFN1000 and In Dialogue with Humanity UGFH1000. More specifically, we added to this game with a historical scenario that recaps the world of the 16th century, the knowledge of the historical background of which is highly relevant to many texts selected in GEF. Students were allowed to choose to play this historical scenario as an optional assessment component of 5-10% of the course. On top of that, one of the term paper questions, an assessment of 30-40% of the course, was provided to students to reflect on the course content based on the game scenario. The nature of the deliverables has not been changed. The timeline matched what was originally proposed that the game as an assessment component for the two courses has been fully launched in 1<sup>st</sup> term 2017/18. As a pilot testing, the game was even in use earlier than was planned for some students in UGFN1000 in the 2<sup>nd</sup> term 2016/17.

**3. Evaluation Plan**

As planned, we have evaluated the project via both quantitative and qualitative methods.

Quantitatively, students' perception on learning outcomes and learning activities were gathered through entry-exit surveys. Academic scores were also collected. Then, through comparison in these aspects between students chose to play and not to play the game, the effectiveness of gamification can be known. Qualitatively, students' opinions shall be collected via sharing sessions and/or focus group interviews.

The quantitative data for the pilot run during Term 2 of 2016/17 was completed and are listed in the following tables. Briefly, the result indicates that the enhanced game as an optional component is successful and is highly correlated with students learning outcomes and other indicators. The analysis for Term 1 2017/18 and focus groups are not yet completed at the time of this report but shall be completed soon.

**Comparison of the two Outside Class Activities (Game vs Online discussion)**  
**Quantitative results for 2016/17 Term 2**

<b><u>Students rating on a 5-point Likert Scale</u></b>	<b>Online Discussion N=73</b>	<b>Play The Game N=40</b>
Online discussion/Playing the game increases my interest in course issues.	2.96	3.92
Online discussion/Playing the game helps me understand fundamental concepts in this course.	3.24	3.92
Overall, Online discussion/Playing the game is enjoyable.	3.27	4.26
Overall, Online discussion/Playing the game is helpful in learning.	3.38	3.92
The current setting for Online discussion/Playing the game is convenient	3.85	4.21

<b><u>Students rating on a 6-point Likert Scale</u></b>	<b>Online Discussion N=73</b>	<b>Play The Game N=40</b>
I am interested in natural science.	4.44	4.82
Scientific knowledge is important for my intellectual development.	4.79	5.03
I understand the development of natural science.	4.48	4.64

I understand various features of scientific methods.	4.63	4.82
I understand the contributions and limitations of scientific inquiry.	4.67	5.00
I can assess the social implications of scientific inquiry.	4.56	4.77

<b><u>Comparison on Grades and Efforts</u></b>	<b>Online Discussion N=73</b>	<b>Play The Game N=40</b>
Grade Point in this course (4-point scale)	3.07	3.36
cGPA before studying this course (4-point scale)	3.06	3.08
Assigned Text Read Completely (out of 11 texts)	7.08	7.73
Lecture Attended (%)	60.0%	69.5%

#### 4. Dissemination, diffusion and impact

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

See attachment “Expo 2017 – Game.pptx”.

*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?*

The project has been reported in a conference organized by my unit and in CUHK teaching and learning expo 2017. Scholars/teachers from within CUHK and other institutes in Hong Kong have shown great interest in adopting gamification in their own teaching.

*Please provide examples of impact: how the project results can be adapted to other disciplines.*

The project has been reported in an international conference in Toronto, Canada. Scholars/teachers from various countries have shown great interest in adopting gamification in their own teaching.

#### PART II

##### Financial data

Funds available:

Funds awarded from CDG	\$ 65300
Funds secured from other sources (please specify: TDLEG awarded on Nov 2017)	\$ 100000
Total:	\$ 65300

Expenditure (estimated as at 22 Jan):

Please note that we have used more student helpers to replace part of the work that was planned to be of a TA/Programmer.

Item	Budget as per application	Expenditure	Balance
TA/Programmer	50,000	24,758	25,242
Student Helper	22,000	27,431	-5,431
Licenses for Civilization	24,000	12,801	11,199

Misc	4,000	0	4,000
Total:	100,000	64,990	35,010

### PART III

#### Lessons learnt from the project

We shall continue to further enhance the game with more relevant course-related content. We have secured another TDLEG for this next stage work.

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

- *Key success factors, if any*  
Gamification is a new trend in education globally. Via a successful educational game, students face challenges and uncertainties within the game scenarios that demand them to think through the educational elements behind. Unlike the traditional classroom teaching, a game visualizes the educational content with which students can interact directly, and the feeling of involvement creates a deeper impact to students' understanding of abstract ideas and their historical background. Playing the game as an outside class activity can also motivate students to learn the relevant subject matter independently.
- *Difficulties encountered and remedial actions taken, if any*  
None
- *The role of other units in providing support, if any*  
The Office of University General Education has provided some administrative support.
- *Suggestions to CUHK, if any*  
There is a potential that the work of this project can reach even a larger number of students after it is fully launched. Gamification should be and can be adopted by more courses in CUHK.

### 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.*

This project focuses on adapting a selected commercial game to facilitate students to study the General Education Foundation (GEF) Programme. The GEF Programme requires students to read classics of science and humanities, and invites them to reflect on perennial questions, e.g. what is truth, what is a good life, etc. Students have to explore a large amount of texts that

covers areas of science, technologies, culture, religions, economics, politics and warfare. The complexity and diversity of background knowledge underlying the classics is a source of difficulties students often encounter in studying GEF.

We believe that gamification can help student overcome these difficulties. Gamification is a new trend in education globally. Via a successful educational game, students face challenges and uncertainties within the game scenarios that demand them to think through the educational elements behind. Unlike the traditional classroom teaching, a game visualizes the educational content with which students can interact directly, and the feeling of involvement creates a deeper impact to students' understanding of abstract ideas and their historical background. Playing the game as an outside class activity can also motivate students to learn the relevant subject matter independently.

*Civilization* is a popular strategy video game series that allows one to make decision to build and to lead an empire to flourish in a simulated world. We modified this game with a historical scenario that recaps the world of the 16th century, the knowledge of the historical background of which is highly relevant to many texts selected in GEF. Students were allowed to choose to play this historical scenario as an optional assessment component of 5-10% of the course. On top of that, one of the term paper questions, an assessment of 30-40% of the course, required students to reflect on the course content based on the game scenario.

## 1. Keywords

*Please provide five keywords (in the order of relevance to your project) to describe your project.*

- (Most relevant)    Keyword 1: Gamification  
                          Keyword 2: General Education  
                          Keyword 3: Classics Reading  
                          Keyword 4: World History  
(Least relevant)    Keyword 5: Science Education

## 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>
(a) <b>Project website:</b>

<i>Nil</i>
(b) <b>Webpage(s):</b>  <i>Nil</i>
(c) <b>Others (please specify):</b>

**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. CU Learning Management System (Blackboard), facebook), please specify.*

<u>Course Code/ Target Students</u>	<u>Term &amp; Year of offering</u>	<u>Approximate No. of students</u>	<u>Platform</u>
<i>UGFN1000/UGFH1000</i>	<i>2016/17 T2</i>	<i>60</i>	<i>Steam</i>
	<i>2017/18 T1</i>	<i>120</i>	

**Table 3: Presentation (if any)**

*Please classify each of the (oral/poster) presentations into one and only one of the following categories*

	<b>Number</b>
(a) In workshop/retreat within your unit (e.g. department, faculty)	<i>1</i>
(b) In workshop/retreat organized for CUHK teachers (e.g. CLEAR workshop, workshop organized by other CUHK units)	
(c) In CUHK ExPo jointly organized by CLEAR and ITSC	<i>1</i>
(d) In any other event held in HK (e.g. UGC symposium, talks delivered to units of other institutions)	
(e) In international conference	<i>1</i>
(f) Others (please specify)	

**Table 4: Publication (if any)**

*Please classify each piece of publications into one and only*

	<b>Number</b>

<i>one of the following categories</i>	
(a) Project CD/DVD	
(b) Project leaflet	
(c) Project booklet	
(d) A section/chapter in a booklet/book distributed to a limited group of audience	
(e) Conference proceeding	
(f) A chapter in a book accessible internationally	
(g) A paper in refereed journal	
(h) Others (please specify)	