

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.

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%