

THE CHINESE UNIVERSITY OF HONG KONG

Micro-Module Courseware Development Grant

Scheme 3: eLearning Pedagogy Research

Interim Report (2017-18)

Report due 31 May 2018.

Please return by email to mmcd@cuhk.edu.hk

PART I

Project title: Evaluation of the teaching and learning effectiveness of the use of flipped classroom pedagogy for Biochemistry courses

Principal supervisor: Dr Patrick Ngai, Dr FH Lo, Prof Shannon Au, Prof SK Kong, Prof PC Shaw, and Prof KB Wong

Department / Unit: School of Life Sciences

Project duration: From December 2017 to October 2018

Date report submitted: 24 May 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 is a pedagogical study of the teaching and learning effectiveness of the e-learning for Biochemistry education. The project objectives include 2 dimensions.

Quantitative Analysis

- i. *User experience*: the number of access and the duration of each access of the e-learning materials by the students have been collected; the data will then be analyzed to study the behaviors and usage patterns of the students.
- ii. *Student performance*: students were asked to complete a questionnaire at the beginning and at the end of each teaching Term to evaluate if the access of the e-learning materials can improve their study performance.

Correlational study: Meta-analysis of the correlation between students' academic performance and flipped-classroom pedagogy has been conducted in selected biochemistry courses. Preliminary data reveals a positive impact of flipped-classroom pedagogy on students' learning. The results will be further analyzed and concluded at later stage.

Qualitative Analysis

- iii. *Student motivation*: several surveys were conducted at the end of each Term to study if

the e-learning materials can promote the motivation of learning. The data were collected for further analysis.

- iv. *Focus group study*: focus group were conducted on a monthly basis; where some feedbacks related to the use of flipped classroom and e-learning materials were collected from the students.
- v. *Interview*: an informal interview session with students was conducted to investigate their learning difficulty achieving the Learning Outcomes of individual courses. Some comments were noted to further enhance the effectiveness of students' learning.

2. Progress on process, outcomes or deliverables

What have been accomplished so far?

As described in the project proposal, *Blackboard* was set up to collect the access data of the students. New tests and questionnaire specific for flipped classroom e-learning materials were designed to evaluate student performance and learning motivation, respectively. Focus group was organized on a monthly basis to collect feedback from the students. The e-learning materials for the flipped classroom were optimized and further designed based on the feedbacks collected. Numerical data of students' learning has been collected and analyzed with computer software.

Have any obstacles been encountered and what are the remaining tasks to be finished?

One of the major obstacles of the current project was the delayed project commence date, such that the project began in the middle of a teaching Term; as a result, we were unable to ideally integrate all the expected components of the study in one single course. Instead, we had to integrate the components in several courses as described in the proposal.

Another obstacle was the diverse background of the students, where some of them had qualifications other than DSE.

Is the project still on time for completion (which includes preparation of the final report) on or before the grant expiry date?

Overall, the project will be completed on time as designed.

Provide a listing of project outputs to date.

Quantitative Analysis

- i. *User experience data.*
- ii. *Student performance data.*
- iii. *Preliminary correlational study data.*

Qualitative Analysis

- iv. *Student motivation analysis*
- v. *Focus group study*
- vi. *Interview study*

Publication in international conference

Two abstracts were accepted for poster presentation in the “**Lilly Education Conference: Designing Effective Teaching**”, Bethesda, USA, 29 May 2018 – 3 June 2018.

1. Implementation of Flipped Classroom in Undergraduate Biochemistry Courses
(Presented by Dr. Patrick Ngai)
2. Development of a virtual laboratory for the teaching of immunohistochemistry
(Presented by Dr. FH Lo)

3. Evaluation Plan

Have you altered your evaluation plans?

Does your evaluation indicate that you have achieved your objectives?

Several indicators were expected to serve as the evidence of success, they are listed as follows,

- I. Percentage of students with absolutely no access to the e-learning materials indicates the popularity of the courseware: small percentage indicates high popularity.
- II. Improvement of a test taken before and after the access of the e-learning materials indicate the achievement of the learning outcomes, which is a promising sign.
- III. Positive student feedbacks collected in the questionnaire serve as the indicator of learning motivation and satisfaction.
- IV. Specific positive comments obtained from the students during the focus group interview indicate strength of the teaching method.
- V. Positive correlation between student performance, learning motivation and satisfaction with the usage time of the e-learning materials also serve as the indicators.

There was one alteration of the evaluation due to the time constraint of the project; a survey at the end of the Term instead of a pre-test was used to study the improvement before and after the access of the flipped classroom e-learning materials.

Overall, our data collected indicated most of the objectives were met.

4. Dissemination Activities (reports, websites, video links, products, etc.)

1. Dissemination of a video clip (2 minutes) on the project work.
2. Presentation of the project work in an international education conference.

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