THE EDUCATION UNIVERSITY OF HONG KONG

FACULTY OF LIBERAL ARTS AND SOCIAL SCIENCES

Research Output/Impact Prize for the Dean's Research Fund 2017-18

Brief Introduction of Awardee's
Research Publication/Study and Future Research Development

Awardee (Dept):	Dr. Song Yanjie, Assistant Professor (MIT)
Publication Title:	How to Flip the Classroom "Productive Failure or Traditional Flipped Classroom" Pedagogical Design?

A. Briefly introduce your research publication/study for which you have received the prize.

Research output: Song, Y., & Kapur, M. (2017). How to Flip the Classroom-" Productive Failure or Traditional Flipped Classroom" Pedagogical Design? *Journal of Educational Technology & Society*, *20*(1), 292. (Ranked A in the EdUHK listed journal)

This article reports on a quasi-experimental study in comparing the "video watching and practice" pedagogical design with the "productive failure" pedagogical design in flipped classroom for a 2-week curricular unit on polynomials in a Hong Kong Secondary school. Different from traditional flipped classroom where students are provided video clips with new concepts and associated procedures to review at home before solving problems in class, the "productive failure" pedagogical design in the flipped classroom worked the other way around. Supported by mobile technologies, students solved problems and shared their results first in class even though they might come across failures, followed by consolidating the newly learned concepts and associated procedures using video clips at home. The pedagogical design is referred to as "productive failure-based flipped classroom" in this study. The research results show that students using the new pedagogical design performed better than those in flipped classroom in problem solving. This suggests that the "productive failure" pedagogical design may be better able to improve students' problem solving skills.

The major contribution of this article is to develop and implement an innovative pedagogical model - "Productive Failure-based Flipped Classroom". It identified the issues of existing flipped classroom pedagogical design: (1) Few studies have reported how to develop school students' problem solving skills and enhance their conceptual understanding in flipped classroom; and (2) The pedagogical design adopted in flipped classroom, in many cases, intends to be "watching video and practice" direct instructional mode, in which students make use of videos as lecture instruction out of class time and practice activities in class time, but are lack of theoretical framework to guide the design and implementation of the learning activities.

B. How you used/will use your prize and perhaps its usefulness to your research development?

1. **The research prize will be used for:**
   (1) Hired services: I will invite the GRF Co-PI Prof. Pierre Dillenbourg from EPFL (洛桑聯邦理工學院) Switzerland to visit EdUHK for GRF project Consultation and discussion of a journal paper writing related to the project *(HK$ 32,200)*;
   (2) Equipment: A laptop was purchased *(HK$ 13236.50)* in order to access the m-Orchestrate learning system developed from the GRF project and help with research findings sharing;
   (3) Computer Hardware & Peripherals: A Network attached Storage (NAS) for data storage and other Peripherals (HK$ 4563.50) will be bought for the convenience of ubiquitous data access and sharing.

2. **The research prize's usefulness to my research development:**
   (1) The consultation service provided by the GRF Co-PI Prof. Pierre Dillenbourg will help make the GRF project of developing and implementing the web-based m-Orchestrate learning system run more smoothly and generate more rigorous findings because the Prof. Pierre Dillenbourg is a distinguished scholar and has expertise in this field. In addition, the researcher can discuss with the Co-PI about a journal paper related to the project in more detail.
   (2) The laptop will help the researcher to access and try the web-based m-Orchestrate learning system anywhere, anytime and identify problems to be solved just-in-time; it can also help the researcher to share the research findings and exchange research ideas with other scholars both within and beyond the university as well as abroad.
   (3) The purchase of the Network attached Storage (NAS) for data storage and other Peripherals will help the researcher to access the data stored in computer anytime, anywhere so that the researcher does not have to save and upload files before leaving office. It can also avoid the problems of urgent use of data which the researcher forgets to save or upload after leaving the office. Moreover, NAS can save the researcher's time in copying and saving the files for data updates from different locations (e.g., home and office).

C. Expected research outcomes/outputs/impacts arising from this prize.

Expected research outcomes/impacts:
1. It is expected that an article co-authored with the GRF Co-PI Prof. Pierre Dillenbourg can be published in year 2019 or early 2020;
2. It is also expected that the m-Orchestrate learning system can be further scaled up and translated to a wider community not only in Hong Kong but also overseas.