RGC Ref. No.:
UGC/FDS24/E01/16
(please insert ref. above)

RESEARCH GRANTS COUNCIL
COMPETITIVE RESEARCH FUNDING SCHEMES FOR
THE LOCAL SELF-FINANCING DEGREE SECTOR

FACULTY DEVELOPMENT SCHEME (FDS)

Completion Report
(for completed projects only)

Submission Deadlines:
1. *Auditor's report with unspent balance, if any: within **six** months of the approved project completion date.*
2. *Completion report: within **12** months of the approved project completion date.*

Part A: The Project and Investigator(s)

1. Project Title

Design and Implementation of an Induction Program to Encourage Teachers to Adopt Mobile Phone-based Student Response System

2. Investigator(s) And Academic Department(s) / Unit(s) Involved

Research Team	Name / Post	Unit / Department / Institution
Principal Investigator	Dr WONG, Adam Ka-lok, Senior Lecturer	PolyU SPEED
Co-Investigator(s)	Dr WOO, Eric Kin-sang, Senior Lecturer	Hong Kong Community College, The Hong Kong Polytechnic University
	Dr WONG, Simon Chi-wang, Lecturer	Hong Kong Community College, The Hong Kong Polytechnic University
Others		

3. Project Duration

	Original	Revised	Date of RGC / Institution Approval *(must be quoted)*
Project Start Date	1 Jan 2017	N.A.	N.A.
Project Completion Date	31 Dec 2018	N.A.	N.A.

Duration *(in month)*	24 months	N.A.	N.A.
Deadline for Submission of Completion Report	31 Dec 2019	N.A.	N.A.

Part B: The Final Report

5. Project Objectives

5.1 Objectives as per original application

1. Help teachers understand the benefits and effective pedagogies in using SRS.
2. Find out the main concerns of the teacher's towards SRS.
3. Design an induction programme for teachers who want to use SRS.
4. Implement the induction programme.
5. Find out the teacher's perception on SRS after using it.
6. Find out student's perception of SRS after using it.
7. Investigate the relationship between student performance and their use of SRS, and find out the moderating factors such as class size, discipline of study, and full-time versus part-time.
8. Share the findings of this research in conferences.

5.2 Revised objectives

Date of approval from the RGC: N.A.

Reasons for the change: N.A.

1. N.A.

2. N.A.

3. N.A.

5.3 Realisation of the objectives

(Maximum 1 page; please state how and to what extent the project objectives have been achieved; give reasons for under-achievements and outline attempts to overcome problems, if any)

All the objectives of the project have been achieved. Three Student Response System (SRS) software products were chosen around reviewing their functionalities and costs. These SRS software products had different features that were suitable for teachers who had different needs and preferences. For example, one such SRS did not require students to log in. This simplified the teacher's operation and reduced students' worry that they might answer the questions wrongly. Another SRS was customised to integrate with the School's single sign-on (SSO) system. This allowed the teacher to track the performance of the students as they answer the questions through the SRS, while minimizing the effort in using the system.

For objective 1, several internal seminars were conducted for teachers in different disciplines to show them the benefits and effective pedagogies in using the SRS. The teachers were asked to prepare some questions that they normally asked in their lessons. In the seminars, an investigator and a research assistant helped the teachers to ask those questions by using the SRS. All the possible question types and major features of the SRS were demonstrated to the teachers. For objective 2, interviews were conducted after the seminars to find out the teachers' perceived benefits and difficulties about using SRS. Those concerns were compiled and input to achieve objective 3, i.e. the design of an induction programme for teachers who wanted to use SRS. For objective 3, the induction program consisted of workshops were organized as a two-part series, and a regular newsletter about the use of SRS. The Part One workshop was at the introductory level. It introduced the teachers to SRS, provided some templates, and suggested some effective strategies. The Part Two workshop taught the teachers to use advanced features in the respective SRS software products. For objective 4, the induction programme was implemented by the Information Technology Unit (ITU) at the investigator's institution at the beginning of each semester during the research period. The induction program also included a video which consisted of student's discussions and teacher's reflections on the use of SRS at the investigator's institution. In the research period, a total of 44 teachers attended the training sessions. The induction programme would continue to be offered after the research period.

For objective 5, an online survey was conducted at the end of each semester to find out the teacher’s perception of SRS after using SRS. For objective 6, student’s perception after using the SRS was found out by conducting surveys. A video was produced by a professional video production company to capture the essence of the focus groups and the teacher's interviews. The video was included as part of the induction program. It was also available in the Learning and Teaching Portal of the Learning Management System (LMS) of the investigator's institution. For objective 7, the relationship between students’ performance and their use of SRS was found out by comparing their participation in SRS and their actual performance in the respective subjects. For objective 8, the findings were shared in three international conferences, namely, Fifth Teaching and Education Conference, International Conference on Education and Learning, and Ireland International Conference on Education. In particular, the Best Paper Award was obtained for the full paper submitted to the Fifth Teaching and Education Conference at Amsterdam, Netherlands in June 2018.

5.4 Summary of objectives addressed to date

Objectives *(as per 5.1/5.2 above)*	**Addressed** *(please tick)*	**Percentage Achieved** *(please estimate)*
1. Help teachers understand the benefits and effective pedagogies in using SRS.	✓	100%
2. Find out the main concerns of the teacher's towards SRS.	✓	100%
3. Design an induction programme for teachers who want to use SRS.	✓	100%
4. Implement the induction programme.	✓	100%
5. Find out the teacher's perception on SRS after using it.	✓	100%
6. Find out student's perception of SRS after using it.	✓	100%
7. Investigate the relationship between student performance and their use of SRS, and find out the moderating factors such as class size, discipline of study, and full-time versus part-time.	✓	100%
8. Share the findings of this research in conferences.	✓	100%

6. Research Outcome

6.1 Major findings and research outcome
(Maximum 1 page; please make reference to Part C where necessary)

This research project aims to design and implement an induction program to encourage teachers to adopt mobile phone-based student response systems (mSRS).

Before designing the induction program, teachers in the investigator's institution were invited to join internal seminars. It was found that most teachers would prefer to use multiple choice (MC) questions only, rather than using other possible question types such as open-ended, clickable images, ranking and voting. They also expressed that they felt confident in using SRS without the need for in-class assistance. Besides, they were concerned about the need for students to sign in. As a result, the induction program included another SRS which provided only MC questions, and did not require signing in.

Based on these findings, an induction program was designed that consisted of workshops that were divided into two parts. In the first part, the teachers were introduced to the benefits of using the mSRS and the three basic different mSRSs. The teachers were also asked to practise using the mSRS of their choice on a question that they would ask in their lessons. The second part consisted of three separate sessions that taught the teachers the advanced features in each of the three SRS software products. The induction programme was implemented during the research period, and a total of 44 teachers participated in the workshops. The induction program will continue to be held beyond the research period.

The responses from the teacher survey showed very positive results. The number of teachers who used SRS increased from 26% to 40% during the research period. Most of the teachers agreed that SRS could help them find out their students' understanding of the subject. The teachers indicated that because students were more keen to answer by using their mobile phones than verbally, SRS could get students answers that helped the teachers to adjust their teaching. However, it was found that SRS was more effective in increasing the teacher-student interaction, than in increasing student-student interaction. It was, however, found that the teacher in the technology discipline did not use SRS significantly more than teachers in other disciplines such as business and social sciences. This was consistent with the teacher survey that showed teachers rated SRS easy to use. The most frequently used question types were, in descending order, MC, open-ended, voting, ranking and clickable image. About 90% of the respondents indicated that they would continue to use SRS in future.

The responses from student surveys also showed very positive results. The students generally agreed that the SRS made the lessons more interesting and increased their interactions with the teacher. The students' responses showed that they were not distracted by their mobile phones when the SRS was not being used. The student focus groups showed that students preferred to have challenging questions that made them think deeply about the subject, rather purely memory-recalls. The student focus groups also revealed the problem of "question fatigue". This problem occurred when the teacher asked questions too many times by using SRS during a lesson.

The research showed the students who participated more using SRS generally achieved better grades. There were no significant variations of this phenomenon across disciplines of study, class size and mode of study (i.e. full-time versus part-time). This implied that SRS would be useful in teaching many subject disciplines.

6.2 Potential for further development of the research and the proposed course of action *(Maximum half a page)*

This research provided insights on the design of an induction programme for teachers to use SRS in higher education in Hong Kong and their perceptions after using it. Given that teachers in different contexts may need different induction programmes and have different perceptions after using it, teachers in the western culture may prefer to have more direct teacher-student interaction instead of using SRS to solicit student feedback. Therefore, it would be useful to find out the teachers' perception on using SRS in higher education in other cultures, such as in western countries, and then compare similar findings in Hong Kong. The teachers and students of this research are at the higher education level, but teachers and students in secondary schools may have different perceptions. Hence, another possible direction is to compare teachers' perceptions of using SRS in secondary schools. Finally, the findings in this research were cross-sectional in nature. The students' attitude in using SRS may change over time. Likewise, the teachers' perception may change after using SRS for a period of time. Another suggested future research is to adopt a longitudinal approach, in which the perceptions of students and teachers are tracked to discover how perceptions may change over time.

7. Layman's Summary

(Describe <u>in layman's language</u> the nature, significance and value of the research project, in no more than 200 words)

In the classroom, teachers have to ask questions in order to teach effectively. However, many students are not willing to answer questions. Many students are afraid that their answers are wrong and they will be embarrassed. As a result, the teachers may either get no responses or only responses from the students who are confident enough to answer the questions. The student response system (SRS) is an effective solution to this problem because students can answer the questions silently using their mobile phones. However, there is a lack of study on mobile phone-based (mSRS). Without a good understanding of SRS, it is difficult to encourage teachers to use it to improve their teaching. This research aims at helping teachers to understand the benefits of using mSRS, and implement an induction program to help them use mSRS to improve their teaching. The induction program was designed and implemented as a two-part series. After the implementation of the program, surveys and interviews were conducted. It was found that both teachers and students had positive perceptions about SRS after using it. The results also showed that teachers across different disciplines found SRS easy to use and intended to continue to use it in their teachings.

Part C: Research Output

8. Peer-Reviewed Journal Publication(s) Arising Directly From This Research Project

(Please attach a copy of the publication and/or the letter of acceptance if not yet submitted in the previous progress report(s). All listed publications must acknowledge RGC's funding support by quoting the specific grant reference.)

The Latest Status of Publications				**Author(s)** *(denote the corresponding author with an asterisk*)*	**Title and Journal / Book** *(with the volume, pages and other necessary publishing details specified)*	**Submitted to RGC** *(indicate the year ending of the relevant progress report)*	**Attached to this Report** *(Yes or No)*	**Acknowledged the Support of RGC** *(Yes or No)*	**Accessible from the institutional repository** *(Yes or No)*
Year of Publication	**Year of Acceptance** *(For paper accepted but not yet published)*	**Under Review**	**Under Preparation** *(optional)*						
2019	2017	N.A.	**N.A.**	WONG, Simon*; WONG, Adam; YEUNG, John	Exploring Students' Acceptance of Using Mobile Device-based Student Response System in Classrooms, *Journal of Interactive Learning Research, Volume 30, Number 1, Publisher: Association for the Advancement of Computing in Education (AACE)*	Yes (2017)	Yes (Attachment 1)	Yes	**Yes**

9. Recognized International Conference(s) In Which Paper(s) Related To This Research Project Was / Were Delivered
(Please attach a copy of each conference abstract)

Month / Year / Place	**Title**	**Conference Name**	**Submitted to RGC** *(indicate the year ending of the relevant progress report)*	**Attached to this Report** *(Yes or No)*	**Acknowl-edged the Support of RGC** *(Yes or No)*	**Accessible from the institutional repository** *(Yes or No)*
June 2018, Amsterdam, Netherlands	Student Perceptions on the Use of Student Response System in Higher Education in Hong Kong	Fifth Teaching & Education Conference	No	Yes (Attachment 2)	Yes	Yes
August 2018, Tokyo, Japan	Designing an Induction Program to Encourage Teachers to use Mobile Phone-based Student Response Systems	International Conference on Education and Learning	No	Yes (Attachment 3)	Yes	Yes
October 2018, Dublin, Ireland	Learning Analytics Based on Data Generated from an Interactive Student Response System	Ireland International Conference on Education	No	Yes (Attachment 4)	Yes	No

10. Whether Research Experience And New Knowledge Has Been Transferred / Has Contributed To Teaching And Learning
(Please elaborate)

1. The knowledge has been used to design the induction programme on using Student Response Systems at the investigator's institution.
2. The video which was created as a part of this research was placed in the Learning and Teaching Portal of the Learning Management System of the investigator's institution. The title was "Student's Feedback and Teachers Sharing on the Effective Use of mSRS Page"

11. Student(s) Trained
(Please attach a copy of the title page of the thesis)

Name	**Degree Registered for**	**Date of Registration**	**Date of Thesis Submission / Graduation**
N.A.	N.A.	N.A.	N.A.

12. Other Impact

(e.g. award of patents or prizes, collaboration with other research institutions, technology transfer, teaching enhancement, etc.)

The Best Paper Award was obtained for the full paper submitted to the Fifth Teaching and Education Conference at Amsterdam, Netherlands in June, 2018.

13. Public Access Of Completion Report

(Please specify the information, if any, that cannot be provided for public access and give the reasons.)

Information that Cannot Be Provided for Public Access	**Reasons**
N.A.	N.A.

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FACULTY DEVELOPMENT SCHEME (FDS)

Completion Report - Attachment
(for completed projects only)

RGC Ref. No.:	UGC/FDS24/E01/16
Principal Investigator:	Dr WONG, Adam Ka-lok
Project Title:	Design and Implementation of an Induction Program to Encourage Teachers to Adopt Mobile Phone-based Student Response System

Statistics on Research Outputs

	Peer-reviewed Journal Publications	Conference Papers	Scholarly Books, Monographs and Chapters	Patents Awarded	Other Research Outputs (Please specify)
No. of outputs arising directly from this research project [or conference]	1	3	0	0	1 video