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Albert W M Lee
Hong Kong Baptist University, alee@hkbu.edu.hk

Joseph K Y Ng
Hong Kong Baptist University, jng@comp.hkbu.edu.hk

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Do Not Turn off Your Mobile Phones in My Lectures – A Mobile Phone Based Response System

Prof Albert W M Lee

Department of Chemistry, Faculty of Science

Prof Joseph KY Ng

Department of Computer Science, Faculty of Science

Abstract

Every student has a powerful wireless signal transmitter hanging around his or her neck or inside the pocket. Our Mobile Response System (MRS) platform can be used to collect and analyze the answers or opinions sent in by the students via SMS messages after a question is posed during a lecture. With MRS, class interaction is greatly enhanced. No set-up or purpose-built response pads (signal transmitters) are needed. The operation cost of our system is very minimal.

Key words

Mobile phone based response system, interactive teaching, class polling system

Introduction

In a typical lecture of class size over 50, interactions among students and between instructor and students are usually very low. Simple talk becomes the norm and learning can be rather passive.

Instructors may try to pose some questions during lectures to gauge the level of understanding of the concepts introduced or to stimulate class discussion. However,

many of our students are afraid to speak up and prefer to avoid embarrassment in front of their peers.

The Mobile Response System (MRS) was developed to remedy the situation. When a question (in multiple choice or opinion survey format) is posed to the class, students can comfortably send in their personal responses anonymously via their mobile phones. MRS can carry out a real

time analysis, and display the answers or opinions. It can further stimulate discussion and interactions among students.

Cell phones are no longer just interpersonal communication necessities. They can become handy teaching and learning tools in lectures via the MRS platform. Therefore, please keep your mobile phones on in my lectures.

Aims and Objectives

1. To develop a location and hardware independent Mobile Response System (MRS) for teaching based on the wireless communication networks with mobile phones as the signal transmitters.
2. To develop a web based software for the MRS.
3. To test out the MRS platform in the teaching of chemistry and computer science courses.
4. To explore the scope and limitations, such as loading capacity and response time, of this Mobile Response System.

Methodology

The overall architecture of the MRS platform is outlined in Figure 1.

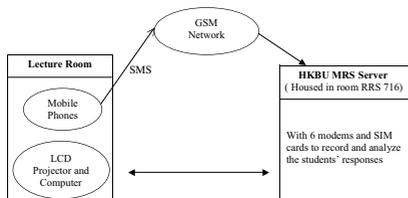


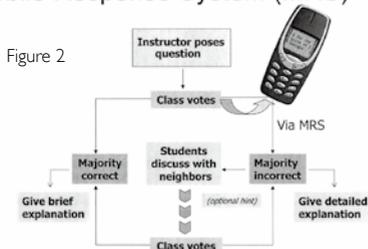
Figure 1. MRS Overall Architecture

Students' responses to the question posed during a lecture are sent as SMS (Short Message Service) messages. There are only six mobile phone service providers (CSL, Hutchison, New World, Peoples, Smartone and Sunday) in Hong Kong. Students use one of the six phone numbers corresponding to the same local service provider that they subscribe to. There are no charges for SMS messages sent within the same mobile phone service provider. Therefore, students do not pay to send in their answers. The SMS messages are logged onto the HKBU MRS server (housed in room RRS 716) via the GSM network and the SIM cards installed in the modems networked to the server. Our MRS software analyses the students' responses and the results, as bar charts or other selected formats, are sent back to the lecture room's computer for LCD immediate display.

Depending on the results, the instructor can ask the students to discuss the question in small groups and then send in their votes again.

A flow-chart summarizing how the MRS platform can be integrated into classroom teaching and learning is depicted in Figure 2.

Mobile Response System (MRS)



The key features of the MRS platform are:

1. Students can send in their responses to a question anonymously. They are no longer afraid to give an answer or opinion in front of their peers.
2. It provides immediate analysis and display of the students' feedback.
3. It can further stimulate class discussion.
4. Compared with other commercially available systems, our MRS does not require any signal receivers inside the lecture room. There are no purpose-built response pads (signal transmitters). The mobile phones are the personal signal transmitters. There is no need to distribute signal transmitters at the beginning or to collect them back at the end of the lecture.
5. The operation cost is minimal. SMS messages sent within the same local mobile phone server provider is free of charge. The SIM cards installed inside the modems networked to the MRS server cost less than HK\$100 each for 6-month period.

Results/Findings

Technically, we found that the MRS concept works as planned. The software system we developed operates smoothly with minimal attendance.

We tested out the MRS platform in the tutorial sessions of Organic Chemistry I & II. Students found little problem in learning how to use the MRS as they are very familiar with sending SMS messages via their mobile phones. The atmosphere of the tutorial session became very lively. They were eager to send in their responses to the questions posed and to participate in the subsequent discussion.

Students' feedback to the MRS platform was very positive. They found it very user-friendly and did not feel embarrassed to answer questions in class. In general, students agreed that the MRS platform could enhance their classroom learning experience. A summary of the student evaluation of the MRS system can be found in Appendix 1.

Upon the invitation from colleagues of the Education Bureau of the SAR Government, we conducted a workshop of the HKBU MRS platform for a group of 20 high school science teachers on November 30, 2007. The list of participants and their school affiliations can be found in Appendix 2. The results of the survey conducted immediately after the demonstration were also highly positive and encouraging (Appendix 3). Many of the school teachers were prepared to incorporate the MRS platform into their own classroom teaching.

Enhancement on Teaching and Learning

According to the survey, both our year-one chemistry students and the high school science teachers found that:

1. The MRS platform is user friendly.
2. With MRS, they do not feel embarrassed while answering questions in class.
3. The MRS gives instant response and feedback to the class.
4. MRS is easy to use and understand.
5. Their learning experience is enhanced.
6. With MRS, they are willing to discuss the questions with their peers.
7. They find it easy to express their opinions in front of peers.
8. MRS is an efficient system for answering multiple choice questions in class.
9. The MRS approach may help students to learn better.

In addition, the MRS can be easily adapted as a tool to take roll call, and to conduct in-class instant tests and quizzes. It can also be used as a platform for collecting and instant analysis of data on a field trip or road-side survey.

Limitations/Difficulties

According to the information provided by the mobile phone service providers, SMS messages they receive via the GSM network will be dispatched to the recipients within 6 seconds. However, on several occasions, we experienced delays

of up to two minutes. If we are going to expand our MRS platform to simultaneous multi-users, the loading capacity of the server and the number of SIM cards/modems needed will have to be carefully evaluated.

Conclusion

A versatile Mobile Response System for classroom teaching has been developed. It is highly user-friendly with very minimal operational cost. No hardware is required in the lecture rooms. No purpose-built transmitters are needed. In the trial runs with year-one chemistry students and a group of high school science teachers, we found that MRS is a very useful tool to enhance interaction in teaching and learning.

References

Landis, C.R., Ellis, A.B., Lisensky, G.C., Lorenz, J.K., Meeker, K. & Wamser, C.C. (2001). *Chemistry ConceptTests: A pathway to interactive classrooms*. New Jersey: Prentice Hall.

The URL of the HKBU Mobile Response System : www.mrs.hk.

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Appendix 1

Mobile Response System (MRS) Student Questionnaire – Statistics

Total Number of Returned Questionnaire: 46 copies

Date: October 16, 2007

	Quality Rating					
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Strongly Agree + Agree
1. The MRS system is user friendly.	17.4% (8)	54.3% (25)	26.1% (12)	2.2% (1)	0%	71.7%
2. With MRS, I do not feel embarrassed while answering questions in the classroom.	37.0% (17)	45.7% (21)	19.6% (9)	2.2% (1)	0%	82.7%
3. The MRS gives instant response and feedback to the class.	13.0% (6)	54.3% (25)	26.1% (12)	4.3% (2)	0%	67.3%
4. I found the MRS easy to use and understand.	32.6% (15)	54.3% (25)	10.9% (5)	2.2% (1)	0%	86.9%
5. My learning experience is enhanced by MRS.	15.2% (7)	37.0% (17)	32.6% (15)	6.5% (3)	0%	52.2%
6. With the support of MRS, the 'ConceptTests' approach has helped me to learn better.	19.6% (9)	47.8% (22)	28.3% (13)	8.7% (4)	0%	67.4%
7. With MRS, I am more willing to discuss the questions with my peer.	30.4% (14)	43.5% (20)	23.9% (11)	6.5% (3)	0%	73.9%
8. MRS is an efficient system in answering multiple choice questions in class.	10.9% (5)	54.3% (25)	26.1% (12)	6.5% (3)	2.2% (1)	65.2%

Appendix 2

Demonstration of MRS to High School Science Teachers, November 30, 2007
List of Participants

No.	Name	School/ Organisation
1	Chow Kwok Lim	Jockey Club TI-I College
2	Ho Kam Yuen	New Asia Middle School
3	Kong Ping Wah	Sing Yin Secondary School
4	Kwong Kit Ling	Bellios Public School
5	Chan Chi Keung	Law Ting Pong Secondary School
6	Ng Kai Bun, Anthony	Fukien Secondary School (Siu Sai Wan)
7	Tse Suk Man	Homantin Government Secondary School
8	Wong Chi Kong, Alex	STFA Lee Shau Kee College
9	Kan Hang Kuen	St. Francis' Canossian College
10	Pun S K	St. Stephen's College
11	Lee Ka Ming	CCC Yenching College
12	Pau Kit	Pui Ching Middle School
13	Ho Yuet Wah	Kwun Tong Government Secondary School
14	Kwok Siu Ping, Joanne	Ning Po No.2 College
15	Lee Charm Kau	HKTA Ching Chung Secondary School
16	Lam King Hang	SKH Bishop Mok Sau Tseng Secondary School
17	Chung Quen Hei	SKH St. Mary's Church Mok Hing Yiu College
18	Cheng Pit Kai	Rhenish Church Pang Hok Ko Memorial College
19	Lam Chi Kin	Rhenish Church Pang Hok Ko Memorial College
20	Chan Pui Kwan	Lung Cheung Government Secondary School
21	Pang Joe	King Ling College
22	Yan Chin Kin	Cotton Spinners Association Secondary School
23	Chu Yun Fat	Bishop Hall Jubilee School
24	Lam Mei Tak	Ng Wah Catholic Secondary School
25	Raymond Fong	EDB
26	Sophia Cheng	EDB
27	Chan Chi Leung	EDB

Appendix 3

Mobile Response System (MRS) Demonstration

Feedback from high school science teachers participated in a workshop co-sponsored by the Education Bureau

	Average Note
1 The MRS system is user friendly.	4.2
2 With MRS, I do not feel embarrassed while answering questions in the classroom.	4.4
3 The MRS gives instant response and feedback to the class.	4.5
4 I found the MRS easy to use and understand.	4.4
5 My learning experience is enhanced by MRS.	4.0
6 With MRS, I am more willing to discuss the questions with my peer.	4.2
7 With MRS, I feel easy to express my opinions in front of my peer.	4.4
8 MRS is an efficient system in answering multiple choice questions in class.	4.4
9 With the support of MRS, the 'ConceptTests' approach may help my students to learn.	4.5

Note:
 5: strongly agree
 4: agree
 3: neutral
 2: disagree
 1: strongly disagree

No. of participants : 24
 No. of return : 22
 Response rate : 91.7%