Classroom communication on mobile phones – first experiences with web-based 'clicker' system

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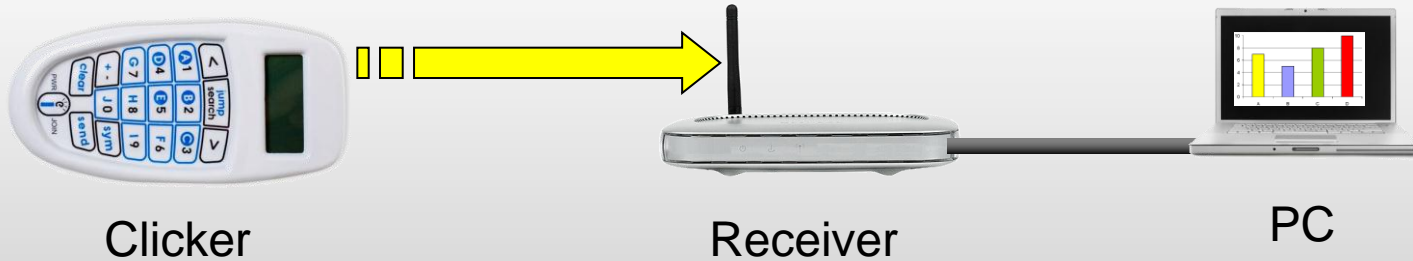
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What are clickers?

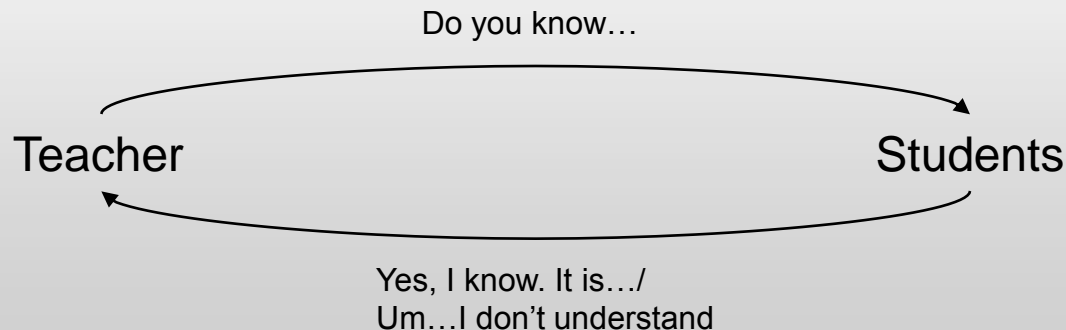Clicker   Receiver   PC
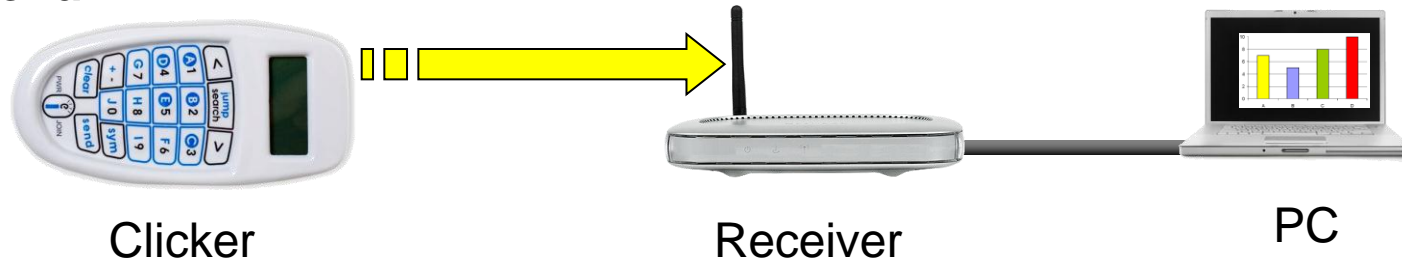
Audience Response System (ARS)

Why use ARS?

Reasons:

- Usually the ARS software can produce a statistical result of the answers chosen by students
- ARS provides students a way to give their answers anonymously, so that the two types of students below are more willing to answer questions:
  - Shy
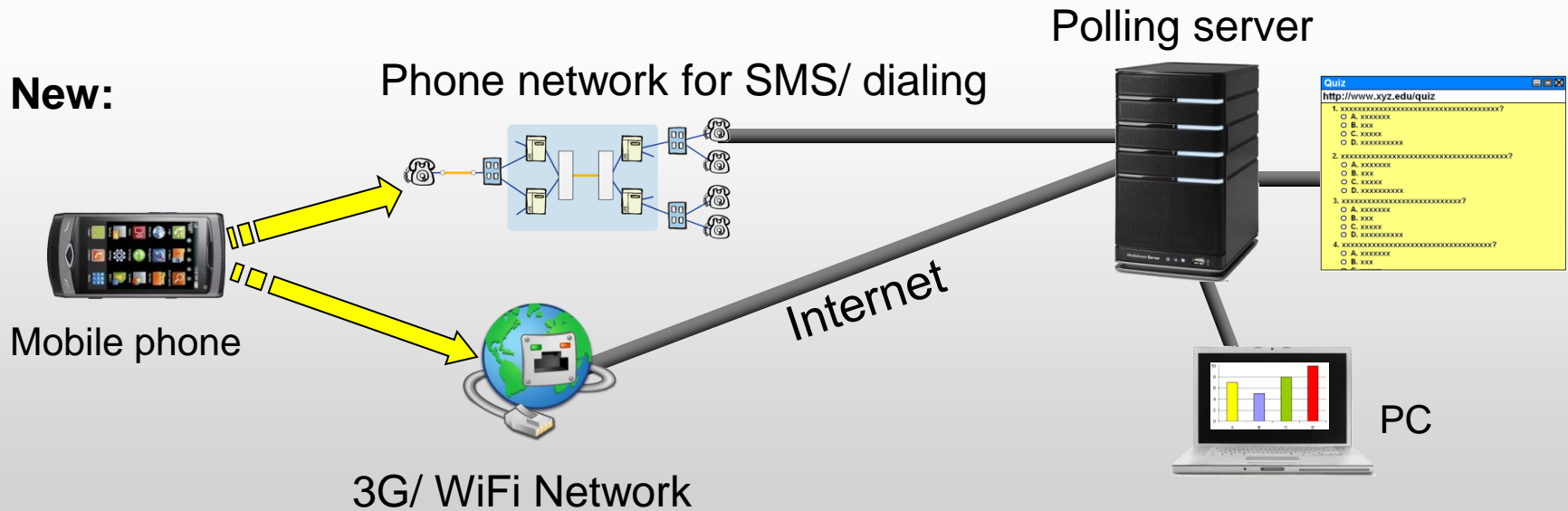 - Afraid of making mistakes in front of the class

Do you know…

Teacher   Students

Yes, I know. It is…/
Um…I don't understand

New ARS in recent years

Traditional:

Clicker   Receiver   PC

New:

Phone network for SMS/ dialing

Polling server

Mobile phone

Internet

3G/ WiFi Network

PC

Three types of new ARS

1. Answer by dialing

2. Answer by sending SMS

Polling server

Phone network for SMS/ dialing

Internet

Mobile phone

3G/ WiFi Network

PC

3. Answer by accessing to the polling server
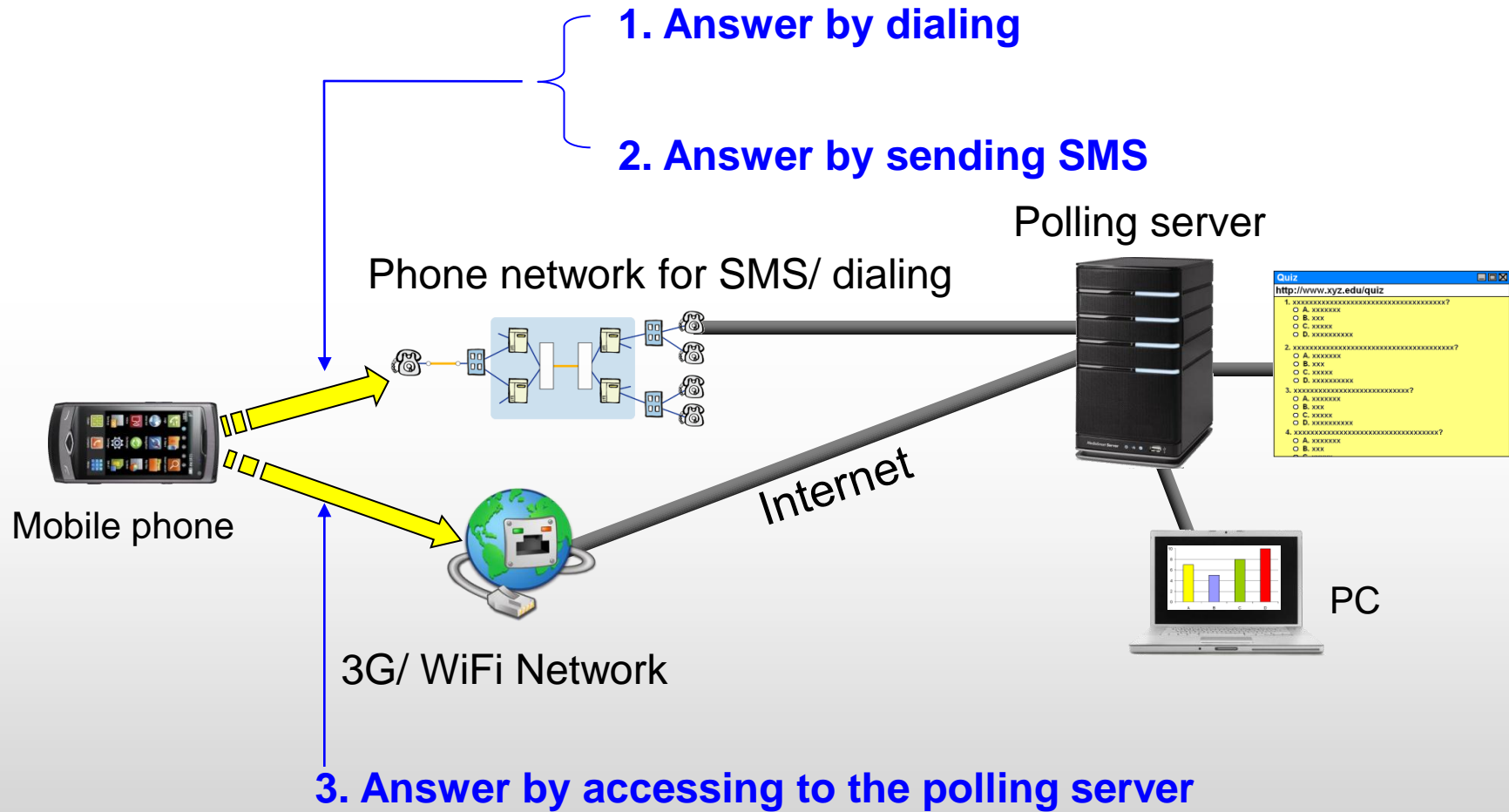
Advantages of new ARS

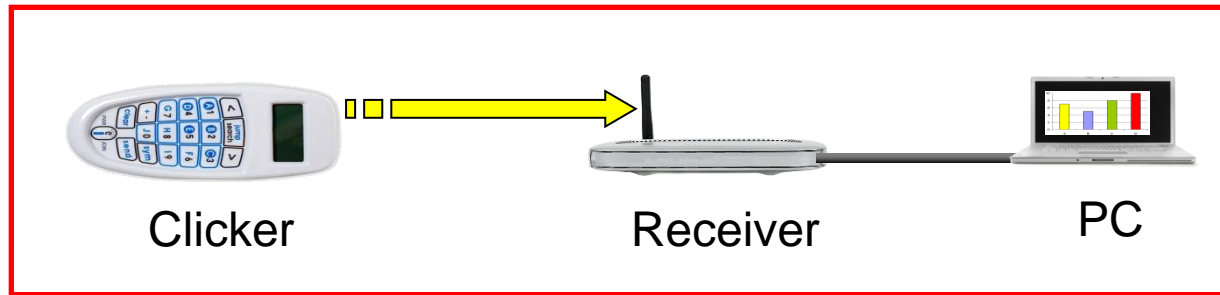| Traditional ARS	New ARS
Need to buy the clickers, the receiver, and the software *Time consuming*	No need; Remarks: WiFi receiver is almost a standard device in classrooms nowadays
Need to check and replace wore out batteries *Time consuming*	No need
Need to bring the whole set of devices to the classroom, and install the software in the computer *Time consuming*	No need
Need to distribute clickers to students and collect back after use *Time consuming*	No need

Previous cases study about new ARS

- Banky (2010): 87 students were required to complete quizzes via dial (1st type of new ARS). 64.4% of the students agreed that this practice encouraged them to attempt the quizzes
- Habel (2011): students became more attentive to the interaction between teachers and themselves. Students understood the teaching better and enjoyed more. (No mention about which new type of ARS used)
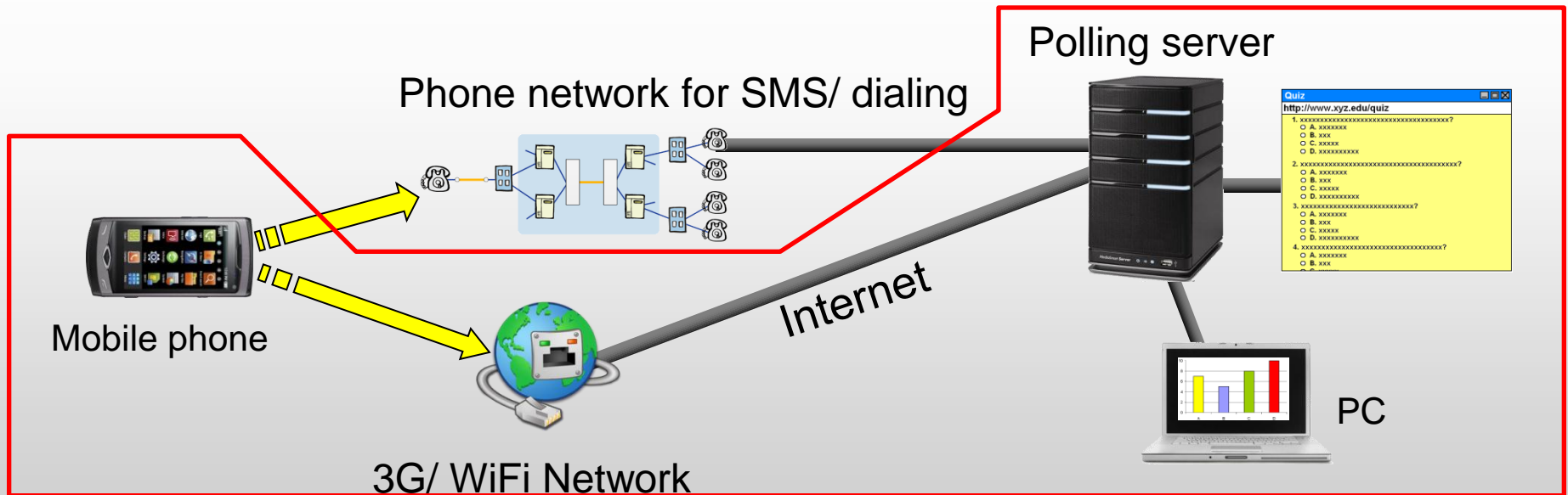
An alternative choice for teachers and students–A hybrid ARS

- Software used: TurningPoint

Traditional ARS

Clicker   Receiver   PC

Polling server

Phone network for SMS/ dialing

Mobile phone

Internet

3G/ WiFi Network

PC

3rd type of new ARS

Our study: Investigate the feasibility of the hybrid ARS

	City University of Hong Kong (Case 1)	The Chinese University of Hong Kong (Case 2)
Purpose of use	Assess the level of students' understanding	Quizzes (end of lesson)
Discipline	Commerce	Mechanical and Automation Engineering

- Training session (~30 min) was provided to teachers
- Evaluation methods: teacher interview, teachers' requests of help, and student questionnaire

Findings – teachers' interviews and requests of help

- Three major problems encountered during the application of the hybrid system
  - Ownership
  - Knowledge
  - Hardware/ software

Case 1–teachers' interviews and requests of help

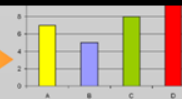| Stage	What did the teacher/ we do?	Problems/ Results/ attempts	Type of problem
Course material preparation	He tried to convert his PowerPoint slides to the format compatible with the ARS.	• He forgot a number of steps. • He inquired the project team for clarifications from time to time. • He sent the project team his PowerPoint slides for double check.	Knowledge
1st time of use	He did not bring any traditional clicker.	It turned out that only a few students had internet-ready devices → he cancelled the activity.	Ownership

Case 1–teachers' interviews and requests of help

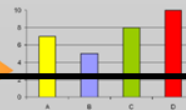| Stage	What did the teacher/ we do?	Problems/ Results/ attempts	Type of problem
2nd time of use	• He brought both traditional and web-based clickers. • One of the project team members was there.	• Misconnection between his notebook pc and the server of TurningPoint. • Problem resolved by re-installing the software.	Hardware/ software
	• He created a web-based clicker session. • He distributed traditional clickers.	15 to 20 minutes were spent before the session actually began.	

Case 1–teachers' interviews and requests of help

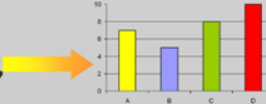| Stage	What did the teacher/ we do?	Problems/ Results/ attempts	Type of problem
2nd time of use	He inquired students whether they were using 3G phone plans.	None of his students had such a plan in their mobile phones.	Ownership
	Students then were suggested to use the campus Wi-Fi service.	• Some of the students did not know how to connect their devices to the campus Wi-Fi as they rarely used the function. • The teacher and the project team member had to assist the students one by one in connecting their devices to the internet.	Knowledge
3rd of use		The teacher was able to administer the session all by himself, the whole activity was carried out smoothly.	No problem

Case 2–teachers' interviews and requests of help

Stage	What did the teacher/ we do?	Problems/ Results/ attempts	Type of problem
Course material preparation		She sought clarifications from the project team regularly when preparing questions for her classes.	Knowledge
1st time of use	She started the system.	The system worked strangely in the lecture room computer: the web session could not be run and she needed to restart the computer, etc.	Hardware/ software
	She asked students to form groups to answer questions	• Only 5 to 6 students had internet-ready mobile devices. • Students unfamiliar with the steps in connecting their devices with the campus Wi-Fi, which later required assistance from both the teacher and the project team member. • The question session had to be cancelled.	Ownership & knowledge

Case 2–teachers' interviews and requests of help

| Stage	What was done	Problems/ Results/ attempts	Type of problem
2nd time of use	•She brought her own notebook and with TurningPoint 2008 installed. •She brought a number of traditional clickers.	• The session had to be cancelled due to a failure in connecting her notebook computer with the system. • After this lesson, the teacher had to revisit the lecture room so as to reconfigure her notebook computer in fulfillment with the networking requirement.	Hardware/ software

Case 2–teachers' interviews and requests of help

Stage	What was done	Problems/ Results/ attempts	Type of problem
3rd and 4th time of use	• Students who did not have internet-ready mobile phones are invited to work with those who have such devices. • Traditional clickers were distributed to groups with no internet-ready mobile phones at all.	• Students could access the internet with their mobile phone. • The students in general enjoyed working on the clicker question in the class.	• No problem

Findings – student questionnaire

	Case 1	Case 2
Response rate	59% (36 out of 61 students)	• 80% (16 out of 20 students who received the questionnaire), 11 of them indicated the response device used. • Seven used traditional clickers and four of them used mobile devices as clickers.
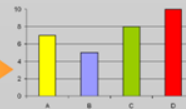
Findings – student questionnaire (5pts - Likert scale)

Dimension	Case 1 (1/5 used mobile phone)	Case 2	
		Traditional clicker (7)	Mobile phone (4)
Process of learning (e.g. increased interaction with the instructor; keep students engaged)	3.7	3.8	4.2
Understanding of lecture content (e.g. help to clarify if students understood concepts taught; gave immediate feedback)	3.5	3.7	3.9
Attitude (e.g. enjoyed using clickers; made students interested)	3.3	3.6	3.9
Overall comment (e.g. using clickers again)	3.5	3.8	4.0
Challenges in use (*lower score means less challenging) (e.g. experienced technical problems; used a long period of time to distribute the clicker)	*3.1	*2.3	*2.8

Discussion

- Factors affecting the feasibility:
  - Ownership
  - Knowledge
  - Hardware/ software

- Teachers should be provided regular consultations and support

Conclusion

- Our finding was just preliminary.
- Considering the following points:
  - Mobile phone students in Case 2 rated the questions higher
  - Changes of factors (ownership and knowledge)
- Future possible study:
  - New ARS replaces old ARS, OR new ARS > old ARS?

Thank you!