

Mobile Participation System (MPS)

Engaging students in higher education via non-traditional audience response systems.

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Research Question

Can students be engaged in large lectures using technology they already own, such as cell phones?

Abstract

Electronic student response systems have become common in institutions of higher education as a means to encourage student engagement, mainly in large lectures. Research has shown that such engagement increases student interest and subsequent learning of the material. To manage this interaction logistically, students use specialized, handheld electronic devices, similar to remote controls, to interact with the instructor.

The Mobile Participation System (MPS) is a response system that reinvents student-instructor interaction through a web-based interface, mobile-phone applications, and text messaging, allowing students to respond to questions posed during lecture with cellular/mobile phone devices. The main advantages of the MPS system are:

- it allows instructors to interact with students during lecture.
- it allows students to use devices that they already own.
- it allows students to respond to not just multiple-choice, but also open-ended questions.
- it can be used to enhance distance-learning classes.

The goal of MPS is to both serve as an effective Student Response System (SRS), while also providing a means to analyze SRS use in higher education. The first phase of MPS development studies the student's perception on its use in the classroom. This data is presented in our paper, in addition to the structure of the Mobile Participation System. The paper also includes a data analysis on MPS effectiveness, as well as several case study applications.

Data Collection Strategy

Thus far, the Mobile Participation System has only been adopted in a single course to test its overall functionality and to assess each student's ability and willingness to use such a system. Given the overwhelmingly positive responses presented in §5, the MPS will be applied widely among several courses in future semesters. The goal of this wider adoption is to gather additional data on the effects and usefulness of this student response system, particularly in large lectures such as an introductory engineering course that regularly enrolls more than 200 students.

Question	Student Response
I used the MPS system whenever a question was posed in lecture.	36.6% answered all questions. 30.0% answered most questions. 33.3% did not participate with the system.
I used the Apple iPhone/iPad app to respond to questions.	19.4% used the iPhone/iPod/iPad smart-phone application to respond.
I used text-messages to respond to in-class questions.	70.9% used text-messages to respond.
The MPS is easy to use.	90.6% responded: agree.
The MPS helped me stay engaged during lecture.	43.7% responded: agree. 43.0% responded: neutral.
The MPS system helped me think critically about the question and its respective answer.	60.1% responded: agree. 39.9% responded: neutral.
I would have liked more use of the MPS system during lecture.	50.0% responded: agree. 34.3% responded: neutral.

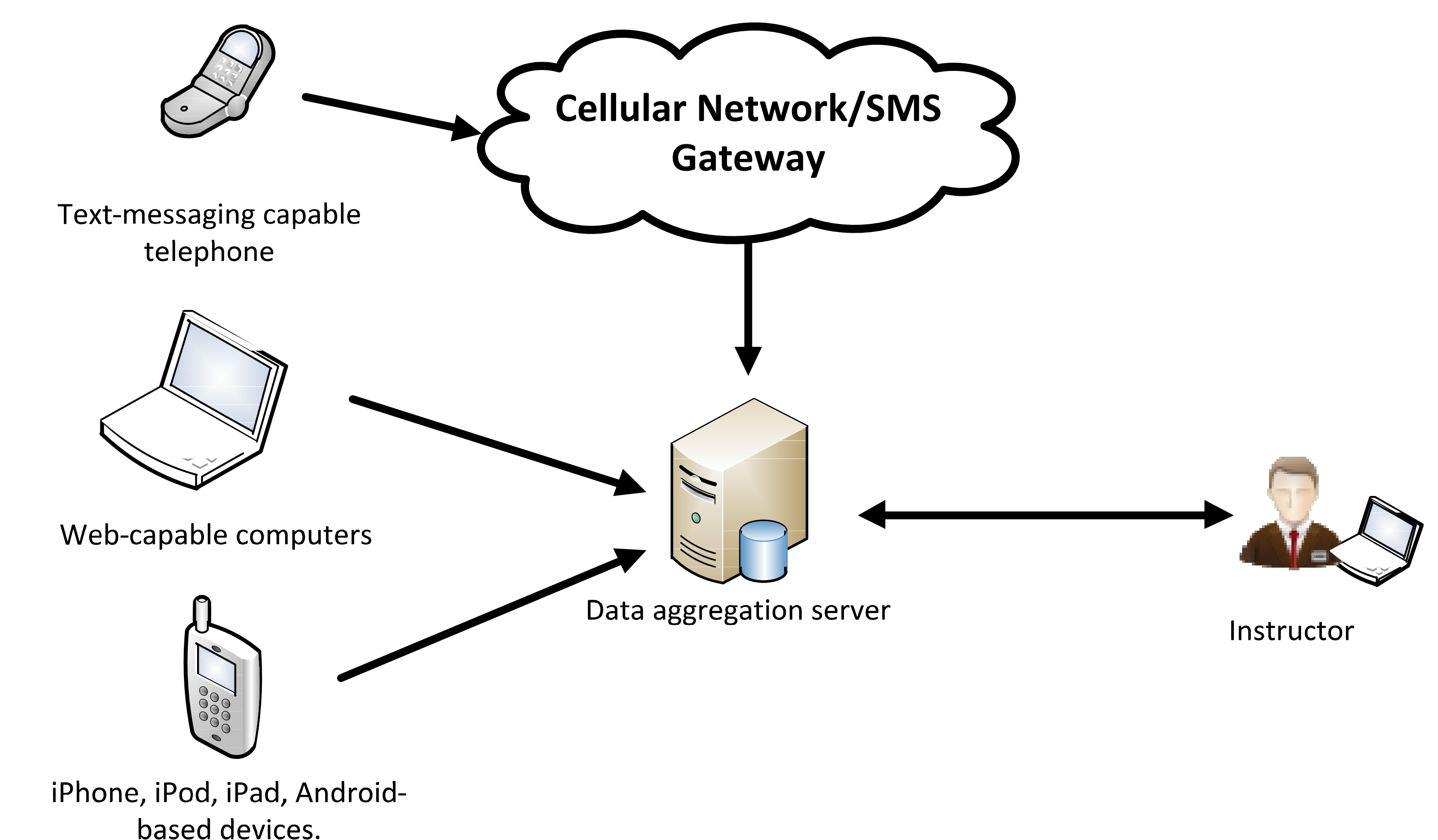
Live Demo

For a live demo of the MPS used during a large lecture in the Industrial & Operations Engineering department, please visit our YouTube Channel.



Go to www.youtube.com and search for "Mobile Participation System" or visit the URL directly: <http://www.youtube.com/watch?v=6HKuH3pq58E>

System Overview



System Overview

Most student response systems use hardware devices, known as "clickers" that students use to respond to questions. These devices send responses to a central unit that is most often connected to a computer for recording and displaying the responses.



Students from the 2010 M-STEM Academy summer programming course show off the wide array of mobile devices that can be used with MPS.

"... I can see this becoming a useful tool. Plus I like that it does not require me to purchase something similar to a [commercial clicker]" – Student in IOE 202, Fall 2010

Students traditionally use clickers to respond to questions.
Photo: New York Times, <http://www.nytimes.com/2008/01/28/education/28neck.html>

Technological Overview

To develop the student response system, a LAMP (Linux, Apache, MySQL, and PHP) architecture was used. Students may either use a web-enabled mobile device or a cell phone with text messaging to submit a response. Responses are stored in a database as they are submitted. An instructor can display responses in nearly real-time as the MPS interface can update a chart of responses every few seconds.

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