

Student Response Systems — Exploring Potential and Assessing Impact

UW-Milwaukee, UW-Eau Claire, UW-Oshkosh, and UW-Whitewater

Abstract

Student Response Systems (SRS) have the potential to provide the means for introducing active student participation and engagement into lecture classes. Student response system technologies equip the student with a personal response unit, or “clicker”, for answering questions posed by the instructor in class. The potential for transforming traditionally passive large lecture classes into stimulating interactive classes is great. Student response systems can engage the attention of students, make them active participants in their learning, and provide them with immediate feedback on their understanding of material. They also provide faculty with information on students’ understanding of course concepts and the ability to adjust course activities based upon student responses. Class responses can also be used as a prompt for classroom discussion and other activities.

The UW SRS Project involves faculty and staff from four UW institutions and is designed to learn how instructors can use student response systems to actively engage students and facilitate student learning. Sixteen instructors from four UW campuses will be supported as they redesign their courses and integrate SRS-based learning activities. The impact of these SRS activities on teaching and learning will be assessed and “best practices” will be distilled and shared with other UW faculty. The project will also create a faculty development program to introduce instructors to student response systems and how to use them effectively. One of the outcomes of the project will be a Student Response System Web site for faculty, LTC staff, and faculty developers, which will include the best practices, resources on student response systems, and the faculty development program for integrating SRS into courses.

Project Narrative

a. Statement of Need/Problem. Instructors across the University of Wisconsin System campuses are rapidly becoming interested in learning how to improve their courses through effective use of Student Response Systems (SRS). These systems permit students to respond individually through personal electronic units to questions posed by the instructor in-class. The students' responses are tabulated, categorized, and projected as summary information on a display screen in front of the class.

The question and response interaction may improve learning in the classroom by:

- Engaging the attention of the students;
- Making students active participants in their learning;
- Providing the instructor with instant feedback about students' comprehension of reading, particular concepts, and overall content knowledge;
- Providing the students with immediate feedback about the accuracy of their understanding of the class material;
- Providing faculty with the ability to customize instruction based on student responses;
- Using an analysis of student responses as the basis for class discussion;
- Communicating to the students that their active participation and processing of concepts is critical to their own understanding and retention of the material;
- Actively engaging students in critical thought processes requiring synthesis of knowledge in answering questions.
- This project will enable UW faculty developers to learn if these systems are in fact effective for teaching and learning, and if so, what the most effective ways are to use these systems in courses. The goal is to learn and disseminate "best practices" of teaching with SRS technologies for use by instructors throughout the UW System. The project will prepare LTDC staffs to support and assist instructors as they become interested in introducing SRS technologies into their courses.

Additionally, this project will allow us to address the persistent issue of the lack of student participation and active learning opportunities in large lecture courses. Instructors are challenged to find effective ways to overcome student passivity and introduce interactivity in large enrollment courses. Student response systems may prove to be extremely effective in addressing this important concern. Consequently, this project will be approached as a Scholarship of Teaching and Learning (SoTL) activity and will receive guidance and support from UW-Milwaukee's Center for Instructional and Professional Development (CIPD).

Faculty from UW-Milwaukee, Eau Claire, Oshkosh, and Whitewater will be supported -- both with stipends and by LTDC staff -- as they redesign parts of their courses to incorporate SRS technologies to facilitate student learning and better accomplish course objectives. We will structure the recruitment and selection of participating faculty so that different disciplines, different class sizes including large enrollment courses, and different pedagogical strategies are represented. This diversity of courses will help to ensure that the faculty participants will conceptualize and implement very different ideas for improving student learning with the technology.

A project web site on student response systems will make available information on the outcomes of the project, which will include best practices, tips and pointers, faculty development materials, and other resources related to the use of student response systems. We will model the SRS web site on the Hybrid Course Project web site, with pages developed for instructors and for LTDC staffs, so that the web resource is accessible and useful to both UW system faculty and faculty developers.

b. Activities & Work Plan. The project's primary collaborative partners are:

- UW-Milwaukee, Learning Technology Center: Robert Kaleta, Tanya Joosten, Gerald Bergtrom; Center for Instructional & Professional Development: Connie Schroeder.
- UW-Eau Claire, Teaching & Learning Technology Development Center: Kathy Finder, Donna Raleigh, Jessica Holm; Network for Excellence in Teaching: Linda Carpenter.
- UW-Oshkosh, IDEA Lab and Media Services: Nick Dvoracek.

- UW-Whitewater, Learning Technology Center: Lorna Wong, Garry Bohm; ITS/Lab: Brett Cook.

Prior to Start of the Project

- Define course redesign expectations for faculty project participants
- Describe other responsibilities of faculty participants
- Recruit and identify faculty participants on each campus
- Identify student response systems to be used on each campus

July -- August 2005

- Conduct face-to-face or online training/orientation/brainstorming session for project participants
- Create a D2L course site for use by project participants to discuss and exchange information
- Faculty redesign modules for their fall courses, integrating pedagogically meaningful uses of student response systems
- Consultation and support provided to faculty by campus learning technology centers
- Begin development of assessment and evaluation tools
- Install student response systems in classrooms, if not already operational.
- Address classroom assignment issues to get participants into rooms with student response systems and address any other campus logistical issues.

September -- December 2005

- Faculty teach redesigned courses utilizing student response system technology.
- Assessment and evaluation tools completed
- Collect data on faculty and student use of student response systems

January -- February 2006

- Faculty debriefing on student response system use
- Compilation of faculty experiences using student response systems
 - What worked well and what did not

- General tips and pointers in using student response systems
- Begin analysis of data collected from faculty and students

March -- April 2006

- Complete analysis of data gathered from faculty and students
- Design faculty development program and materials to prepare faculty to use student response systems
- Develop content for Student Response System Web site to include best practices, tips and pointers, results of the data collected, Web resources, etc.

May -- June 2006

- Develop Student Response System Web site
- Develop learning objects needed for faculty development/training program on student response systems.

Post-Project Activities

- Prepare Teaching through Technology newsletter articles on project outcomes
- Give presentations on outcomes at state, regional, and national conferences
- Prepare progress report and a final report to submit to OLIT at UW System by 8/31/06.

c. Project Outcomes and Evaluation

Project Outcomes. Some project outcomes will be specific and immediate, while others will be more general and take longer to manifest themselves. The more immediate outcomes will be measured qualitatively or quantitatively as described in the evaluation section. Some of the anticipated immediate benefits are:

- Create pedagogically effective applications for the use of student response systems

- Increase student learning in lecture classes by increasing student participation and interaction through the use of student response systems
- Develop alternative instructional models utilizing student response systems that benefit nontraditional students and accommodate the diverse learning styles found in the classroom.
- Gather information from faculty on what works and what does not work when using student response systems in the classroom
- Create a model faculty development program for effectively using student response systems that can be readily adapted by all of UW institutions.
- Develop a Web resource as a means to disseminate best practices in the use of student response systems for teaching and learning and to make available faculty development and training resources.

The more general and long-term outcomes cannot be as readily measured. For example, the project will continue to foster inter-campus collaboration among faculty and encourage faculty to use technologies in updated and pedagogically effective ways. This enhances the quality of teaching and learning in the UW System and fosters student achievement and excellence. The reality is that this project has the potential to affect hundreds of instructors and thousands of students in the UW System. It will have a major impact upon the UW if it succeeds in assisting faculty in large lecture courses to venture beyond their traditional lecture pedagogy into a pedagogy that integrates active learning into large enrollment courses. SRS may provide a means to an instructional end that was considered unachievable given the constraints of large lecture courses.

Evaluation. We will utilize both quantitative and qualitative methodologies in evaluation of the project outcomes. Qualitatively, the faculty and staff involved will develop a set of criteria to assess the usefulness of SRS. We will organize various debriefing sessions and focus groups in order to gather faculty reports on the SRS for analysis. Also, a thematic analysis of narratives will be conducted using individual comments and stories gathered during one-on-one training appointments and gathered from

email correspondence from faculty queries and problems during the Project. Further, we will examine faculty's perceived effectiveness of SRS across disciplines.

We will gather anonymous student evaluations by survey, which will contain a series of questions that asks about students' attitudes towards the use of SRS in the classroom as well as their evaluation of the course itself. In addition, we will administer surveys to examine students' satisfaction with the clicker (e.g., ease of use, cost), satisfaction with course design, perceived communication interaction in lecture, overall effectiveness, and perceived performance. We will conduct various multivariate analyses in analyzing the data to produce quantifiable results of the effectiveness of the technology regarding performance and satisfaction.

Depending on faculty participants, we will conduct a case study focusing on two courses conducted in parallel with one lecture utilizing a student response system and the other offered in a traditional setting without SRS. We will examine several variables to measure the overall value.

d. Dissemination. We will share and disseminate the activities, outcomes, and lessons learned from this project in a number of ways.

- We will develop a project Web site on student response systems and will make information on the outcomes of the project available to all UWS faculty, which will include assessment and evaluation results, best practices, tips and pointers, lessons learned, faculty development materials, and other resources related to the use of student response systems.
- During 2006-2007 academic year, there will be presentations on each participating campus that review the activities of the project and showcases some of the uses of SRS that were developed. Articles and news notes about the project will be written for local campus publications.
- Articles on the project activities and outcomes will be prepared for an issue of UW System's *Teaching Through Technology* (TTT) that will focus on student response systems.
- The project partners will organize sessions about this project and its outcomes at the LTDC semi-annual conference.

- We will prepare a progress report and a final report and submit to OLIT at UW System by 8/31/2006.
- We will develop presentations on the project and its outcomes and deliver at state, regional, and national conferences.

Budget and Budget Narrative

We will distribute faculty stipends to three to five faculty members at each of the four institutions for a total of 16 faculty stipends of \$1500 each for the 2005 fall semester. The UW-Milwaukee Learning Technology Center Staff will assign .25 FTE (\$15,000) as lead in the project, UW-Eau Claire, UW-Oshkosh, and UW-Whitewater will each dedicate .10 FTE (\$6,000), and UW-Milwaukee Center for Instructional and Professional Development (CIPD) will dedicate .05 (\$3,000), as collaborative partners in the project.

More specifically, faculty will:

- Redesign a course or course module(s) to integrate the SRS technology into a current class and teach the redesigned course in fall 2005;
- Gather data from their redesigned course during fall 2005 as requested by the evaluation project coordinator and submit a final report that describes their course learning objectives, their implementation of SRS technology, and the outcomes and evaluations of SRS from both the students' and instructor's perspectives;
- Provide guidance to project managers for the development of the SRS web site and the SRS faculty development materials and program.

LTDC staff will:

- Recruit and select faculty to participate in the SRS project;
- Plan and provide orientation and training for faculty participants;
- Inventory and plan for classroom use of SRS technologies on each campus;
- Develop project surveys and assessment plans;

- Gather data, analyze data, and prepare reports, including final project report to UW;
- Write articles and publicity releases for disseminating information and generating awareness about SRS in general and specifically, about the local campus uses of SRS;
- Create faculty training material and programs for use by other UW institutions;
- Develop SRS Web site, including materials used and collected during project, examples of courses that effectively integrate SRS, links to exemplary SRS sites, explanations of “lessons learned” from the UW SRS project, articles written by project participants, and materials and processes developed for assisting instructors to effectively use SRS in courses;
- Submit presentations about the UW SRS Project to regional, state and national conferences;
- Submit articles for a TTT issue dedicated to the use of SRS in the UW System.

CIPD staff will:

- Assist with the assessment of the impact of student response systems on teaching and learning;
- Explore opportunities to integrate the Student Response System project with campus Scholarship of Teaching and Learning initiatives;
- Develop concepts for incorporating project outcomes into campus faculty development activities and programs;
- Provide consultation and advice on the content developed for the Student Response System web site;
- Help to disseminate to campus faculty development centers and OPID staff project outcomes and their implications for teaching and learning.

In addition, \$2,500 is requested for travel for two meetings involving faculty participants and LTDC participants from the four campuses. The initial meeting is to provide orientation and training on student response systems and to foster a collaborative idea exchange about use of SRS in their courses among the faculty participants. The second meeting is for debriefing and evaluation of the project

course outcomes, brainstorming on developing the UW SRS web site, and discussing “next steps” for facilitating SRS use by instructors throughout the UW System. The reimbursement will cover mileage, meals, and possible hotel accommodations.