

Professional Development Grant: *Community of Practice: The Use of Personal Response System Technology in Large Lectures*

Final Project Report
June 27, 2008

Original Objectives and Strategies

I. Grant Description:

In June, 2007, UMass Amherst received a Professional Development Grant in Instructional Technology from the President's Office to support a new *Community of Practice: The Use of Personal Response System Technology in Large Lecture* program. This yearlong program brings together a selected group of faculty members from various disciplines across the campus who are currently using clickers in their classes. The *Community of Practice: The Use of Personal Response System Technology in Large Lecture* program was developed through the joint efforts of the Center for Teaching, the Center for Educational Software Development, and the Provost's Office. The best practice fellows' meetings are led by two UMass Amherst faculty members, Nathalie Lavoie from Resource Economics and Randy Phillis from Biology, both of whom have extensive experience in use of PRS technology and designing PRS questions in enhancing learning in large lectures..

II. Recruiting Fellows:

Between June and August, the Primary Investigators met to design the *Community of Practice: The Use of Personal Response System Technology in Large Lecture* program following the successful faculty fellowship model already established on the UMass Amherst campus. They were able to select a group of faculty members from various disciplines across the campus who are currently incorporating the Personal Response System in their teaching. The following faculty members participated in the *Community of Practice: The Use of Personal Response System Technology in Large Lecture* program:

PRS Fellows:

Beatrice Botch, Chemistry
Catherine West, Accounting & Information Systems
Ray La Raja, Political Science
Zane J. Barlow Coleman, Biology
Nelson Lacey, Finance & Operations Management
Stephen E Schneider , Astronomy
Robert Maloy, TECS
William Gerace, Physics

Co-Facilitators:

Randy Phillis, Biology
Nathalie Lavoie, Resource Economics

Co-PIs:

Mei-Yau Shih, Center for Teaching
Richard Rogers, Provost Office
David Hart, Center for Educational Software Development

Activities Carried Out

I. Monthly Meetings

Beginning in September 2007, the *PRS Community of Practice* program met a total of ten times in both fall and spring semesters. In fall semester, we met on September 12th, October 3rd, October 31st, November 28th, and December 12th from 4:30 to 6:00 pm. During the spring 2008, we met on February 6, February 27, March 26, April 9, and May 7th. The meetings were facilitated by Nathalie Lavoie (Resource Economics) and Randy Phillis (Biology) at the UMass Amherst Campus Center.

The seminars have focused on the following areas to address the issues of best practice in using PRS in the classroom:

1. How do we use in-class PRS questions to diagnose or identify students' misconceptions and set up learning experiences that lead to conceptual change?
2. How do we manage and guide discussion associated with PRS questions?
3. Guidelines of questions design.
4. Examples of good and not-so-good PRS questions; why questions work or why not?
5. Students' perceptions of PRS use and strategies to address these issues and optimize their learning experiences.

II. Student Focus Group

On April 29th, 2008, a student focus group meeting was held to gather students' perspectives on PRS use on the UMass campus. Forty-five (45) UMass undergraduate students from 22 majors met in the UMass Lincoln Campus Center to help fellows grasp students' perceptions of PRS use and ways to address issues and to optimize their learning experiences. They were put into groups of six to eight to discuss and reflect on their experiences of PRS use in their classes and their overall impression how this type of technology helps them understand material better, engage in large lectures, and participate in class discussions. The results of this student focus group meeting showed valuable insights from students and suggestions for better implementation of PRS in large lectures. (See Appendix A)

III. Campus Wide Workshops

Throughout this year, the PRS Best Practice Fellows have hosted two campus wide workshops, one in each semester. On Tuesday, November 13th, the Center for Teaching, Center for Educational Software Development, and the Provost's Office presented a workshop entitled **Teaching with Clickers: Using the Personal Response Systems (clickers) and PRS Software**. The event was well attended with faculty members and professional staff from 34 departments. The workshop was co-presented by Nathalie Lavoie, Randy Phillis, Richard Rogers, and PRS Best Practice Fellows. Materials used at the workshop can be found at <http://www.umass.edu/cft/events.htm>

On Wednesday, March 5th, 2008, the PRS fellows presented a workshop entitled **How to Write Effective PRS questions**. The event was well attended with faculty members and professional staff from 25 departments and participants from Five Colleges. The workshop was co-presented by Nathalie Lavoie, Randy Phillis, Stephen

Schneider, Rob Maloy, and Ian Beaty with other PRS Best Practice Fellows as table facilitators. Materials used at the workshop can be found at <http://www.umass.edu/cft/events.htm>

IV. PRS Websites, Video, Brochure and Handbook

The Provost's Office at the Amherst campus has contributed funding for the website development that was cut out of the original grant request. With that, a PRS Fellows Wiki was developed to enhance engagement and communication among fellows between the seminar meetings. It includes: file sharing, a web-bibliography, PRS best practice documents and seminar summaries. Its URL is: <http://prsumass.pbwiki.com/>. An open PRS web site was revised to host a wide range of resources for students and instructors that include hardware setup, software training, PRS course management, and numerous sample PRS questions from different disciplines. Its URL is: www.umass.edu/prs.

During the spring semester, 2008, the UMass Academic Instructional Media Service (AIMS) helped produce a DVD that highlights the best practice fellows program, which includes why and how faculty adopts PRS in their classes, fellows' reflections of participating in this year's PRS best practice fellows program, and their advice to new PRS users. A printed pamphlet was also created to give an overview and introduction of PRS resources on this campus. This printed PRS pamphlet will be disseminated in the upcoming New Faculty Orientation this August at the UMass Amherst campus and is available through the Center for Teaching.

During May and June 2008, the grant participants worked to synthesize the best PRS teaching practices and created a handbook, entitled "Personal Response System (PRS): A Handbook for UMass Faculty." The final handbook is targeted at instructors new to PRS, providing a general understanding of PRS teaching. It includes practical tips from the seminar discussions, workshop materials, students' feedback, and references cited from literature reviews. In this handbook, the materials were organized into five major categories: 1) Teaching with Clickers Overview; 2) Getting Started; 3) Writing Good PRS Questions; 4) Assessments: Assessing Your Teaching and Students' Learning; and 5) Resources. A working version of this handbook can be found at: www.umass.edu/prs

Assessment

As is suggested by the list of activities, the *PRS Community of Practice* program has contributed to the UMass teaching community on at least four levels. First, this best practice community has helped individual faculty members develop the knowledge and expertise necessary to create and implement effective questions for promoting active learning in classes. Second, the community offered the opportunity for a number of UMass Amherst offices to collaborate in the delivery of undergraduate education. Third, the program has created a network of "experts" in teaching large lecture course with clicker technology which can be used to work with instructors on the Amherst and other campuses. Finally, the community has implications for UMass undergraduate education system-wide as it has shared many best practices of undergraduate teaching with clickers in large lecture from this one-year grant project.

We have achieved our goal of this *PRS Community of Practice* working collaboratively with faculty members in creating consistent principles and instructional strategies for large lecture courses, to “seed” development skills in a wide range of disciplines, and to share the unique products of this community of best practice with faculty from this campus and beyond. Our community has served as a model for large, multi-campus university systems that wish to support faculty members in providing their students with active learning experiences that are not only technologically sophisticated, but also thoughtfully centered around teaching, learning, and qualitative assessment.

Issues and further questions

Identification of PRS assessment and applications for humanities

The group identified two specific assessment and pedagogical needs that the campus should address:

1. Developing a method for assessing the effectiveness of using PRS in teaching and learning
2. A wider discussion of applications of PRS to address the specific needs of and components for humanity disciplines

The principle investigators on this project have agreed to focus attention on these two needs in the next year.

Disposition of funds:

Online Fellows Financial Summary

Total Budget		\$15,000.00
Stipends –Co-facilitators	\$3,000.00	
Stipends – Fellows	\$4,000.00	
Salary subtotal	\$7,000.00	
Workshops/Seminars	\$2,500.00	
Administrative Expenses	\$1,200.00	
PRS video	\$2,500.00	
PRS Brochure	\$400.00	
Design, and edit of an online handbook	\$1,400.00	
Total Expenses		\$15,000.00

What is PRS anyway?

PRS (Personal Response System) is a simple, inexpensive technology tool that allows students in both small and large lecture courses to use handheld transmitters to submit answers to questions. The students' aggregate answers are displayed via a computer projector, providing immediate feedback and stimulating class discussion. In the process, both student attendance and participation are recorded in a computer file.

In 2002, UMass received a grant from the Davis Educational Foundation and began the Davis Large Lecture Redesign Project. The project embraced PRS as a tool to improve active learning in large lectures and paid to equip several lecture halls with PRS receivers. In 2007, the Center for Teaching, Center for Educational Software Development and the Provost's Office received a Professional Development Grant in Instructional Technology from the President's Office to co-sponsor a PRS Community of Practice. In this yearlong program, faculty members worked together to develop consistent principles and instructional strategies for teaching large courses and then shared the unique products of this community of practice with larger teaching communities.



Other Resources

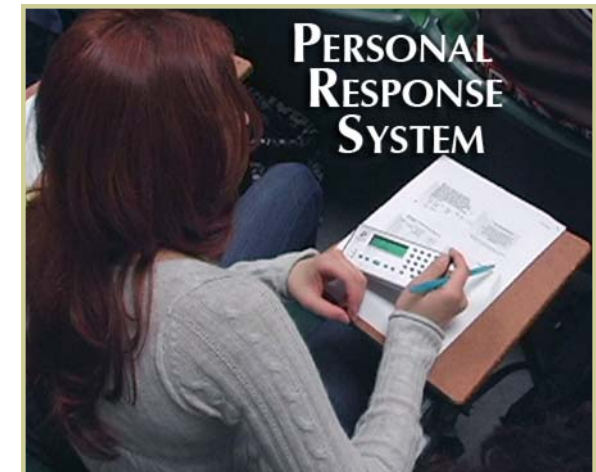
UMass PRS Web site:
www.umass.edu/prs

Center for Teaching:
www.umass.edu/cft

Center for Teaching
Goodell 301
Tel: 413-545-1225
Fax: 413-545-3829
<http://www.umass.edu/cft>



University of Massachusetts
Amherst



*An informational
guide to the Personal
Response System at
the University of
Massachusetts
Amherst*

Getting Started

Who is using PRS?

The Physics Department was the first to use PRS in classroom instruction, and in 1998 Resource Economics adopted PRS in a large lecture course (200 students). About 50 professors and 21 departments are now using PRS at UMass, a large increase since 2000.



What is special about PRS?

PRS encourages active learning in large lecture courses by requiring students to both have and express their answers and opinions via the PRS clicker, thereby increasing the student's level of engagement with the course and its material.



Instructors receive immediate feedback on whether or not the students understand the concepts being taught in that

lecture. With that knowledge, instructors can clear up points of confusion immediately rather than having to wait for quiz or test results and then having to revisit the subject during another lecture. And while the PRS system will record answers for grading purposes, a particular student's answers are anonymous in lecture itself, giving students a relatively low-risk opportunity to make

Checklist for Instructors

If you're interested in using PRS in your class, here are some things you need to do and some issues to consider.

Requirements Checklist

- You have a classroom equipped with an LCD projector.
- You have installed the PRS software from the InterWrite web site (<http://www.einstruction.com/>) on a laptop (PC or Mac) to use in class.
- You have used the software to create a course for your class and have learned the basics of operating a PRS session (For more information, see www.umass.edu/prs).
- You have placed an order with the Bookstore for clickers, especially if it is a large class.

Pedagogy Considerations

- Use clickers for enhanced learning, not just for testing or attendance tracking.
- Replace time spent preparing specific topics to present in lecture with time spent preparing PRS questions to help students work with the topics to reach understanding.
- Have a clear grading policy for PRS including coverage of absences, cheating, technical problems, forgotten clickers, dead batteries, and include the policy in your syllabus.
- Adjust class time to allow for class discussions (discovery) to enhance or refine content coverage.
- Have a strategy for facilitating discussion with large groups.
- Benefit from others. Visit PRS classes and consult with your PRS colleagues.

Management Issues

- Provide instructions to your students for setting up their clickers and joining the class (see www.umass.edu/prs).
- Consider using SPARK or OWL to help manage the administrative side of PRS and, if possible, train a student, graduate or undergraduate, to assist you with PRS.
- Consider using Excel or a similar program in addition to the PRS gradebook or have a Teaching Assistant who can manage grade files including a secure way to share scores to date with students (e.g. SPARK and OWL do this in a FERPA-approved way).
- Set aside at least one hour each week for creating / updating / improving PRS questions.
- Set aside at least one hour each week for managing student / PRS issues.

Visit the UMass PRS Website

<http://www.umass.edu/prs>

- Current Users Group: Join, Ask, Meet
- Current PRS-ready rooms
- A video of PRS training tips
- Information regarding the use of PRS in courses
- Examples of PRS grading policies
- Examples of PRS questions

University of Massachusetts Amherst

