Be Free To Teach

Personal Response Systems

Teaching Effectiveness Program / Academic Learning Services

Using PRS To Facilitate Active Learning in Any Classroom

Personal response systems are essentially similar to the gadget used in the "ask the audience" section of "Who Wants to be a Millionaire." They allow students to select anonymously an answer to multiple-choice questions displayed by the lecturer. Students choose their answers on handsets that send infrared signals to a receiver attached to the lecturer's laptop, and the results are displayed for the whole class to see.

This technology allows instructors to:

- Assess students' understanding of the subject matter.
- Receive immediate feedback and reinforcement for what is being learned.
- Get shy and under-prepared students to participate.
- Poll students' opinions and preferences instantly.
- Observe student misconceptions.
- Encourage peer instruction.

Quick Tips from the Veterans:

- ***If you can, try it out in the actual classroom before you introduce it to students.***
- ***Know what your goal is or why you're using PRS.***
- ***As with any technology, have a contingency plan in place.***
- ***Prepare your students.***
- ***Plan, plan, and plan.***

The Big Picture

How Does PRS Work?

An instructor using PRS poses questions to the class, most often using a multiple-choice format. Students answer by pressing a number on a pocket-size wireless transmitter. The signal is sent to a receiver that is connected to a projector via a computer. Each signal received causes a box shown on the computer screen to change color. That box shows the ID of the corresponding transmitter, confirming receipt of the response. The instructor can choose to either hide or display the answer itself. At the end of a given time period, a statistical summary of the responses is shown graphically as a histogram.

UO Availability

There are three rooms currently set up with receivers - 180 PLC, 123 Pac, and 100 Will. Additionally, Media Services has a portable unit available for checkout that is equipped with 80 handheld transmitters, and the receivers you will need. You can also arrange to borrow a laptop configured with the appropriate software if you do not have your own.

What if you could…

- ***Instantly assess your students' understanding of the material you had been presenting to them for 20 minutes?***
- ***Engage the 250 students in your introductory biology course with the material through group work and interactive lecture?***

Student Accountability

At this time we do not have a system in place for instructors to keep track of participation or individual/group answers to questions. The system does allow an instructor to get a more accurate "read" of general student audience understanding of the material being presented.

Equipment Needs

- *Computer*
- *Display*
- *Connectivity*
- *PRS System*

Not sure what any of this means? That's okay. Media Services can explain all that and more in the orientation session you'll schedule.

Getting Started

Any time you're trying something new in class, planning is essential. Here is a timeline that might help guide that planning.

Two Weeks Prior to Use

- **Reserve a laptop from Media Services** if necessary.
- **Reserve PRS handheld devices from Media Services** and make plans for someone to deliver them to your room. (You will need to request the "portable PRS system" if you are using any room other than 180 PLC, 123 Pac or 100 Will.)
- **Contact Media Services to set up an orientation session.** During this session, your computer, if you do not plan to check one out from Media Services, will be configured with the software necessary to use PRS and the USB adaptor (if that's necessary.) This orientation session will take you through the set up and the basics for how the software works. It is important that you practice using the software until you feel comfortable and confident.
- **Develop the necessary materials** including an electronic copy of your questions (most likely using a large font in Microsoft Word), a contingency plan, and a preliminary activity to effectively use class time in case Media Services is still setting up the equipment at the start of class. You can use the **PRS Planning Checklist** starting on page 4 as a guide.
- **Determine how you will get your electronic files onto the computer.** What data transfer possibilities do you have with the computer you are using? Will you need to put your file on a floppy disk? A Zip? A CD?

"Teaching, real teaching, is -- or ought to be -- a messy business".

-Harry Crews

One Week Prior to Use

- **Load a copy of your question file onto the computer.** Note the location of the file so you can find it again for class. You might even want to open the file and the PRS software on the machine and resize the windows for clear visibility.
- **Set up your PRS session** prior to class in order to save time. Which setting you choose will depend on your intended use.

Day of Use

- **Someone from Media Services will deliver the equipment for PRS** on the scheduled day and set up the computer and the receiver. That person will return before the class is dismissed to pick up the equipment. That person WILL NOT stay and run the program for the instructor.

Instructions to Students

- **The handhelds transmit using line of sight,** like the remote control for a TV or VCR. Students need to aim the narrow end of the transmitter at the nearest receiver to send their answer.
- Students can watch the boxes on the display screen for confirmation that their response has been received.
- The PRS software allows options for how many attempts a student gets to answer a question or whether they can change their answers. Students need to know your parameters for responding.
- When changing answers there is a built-in delay before the new answer can be sent out and only the last answer sent and received will be recorded.
- If a confidence level is desired for an answer press:
    - H and then the number of the answer desired to indicate certainty or a high confidence level.
    - L and the number of the answer desired to indicate uncertainty or a low confidence level.

"Teach to the problems, not to the text."
--E. Kim Nebeuts

PRS Planning Checklist

You're thinking about using PRS? Great! Here's a checklist of things to think about as you begin your planning.

Equipment – What do you need and where are you going to get it?

- ❑ ***Computer*** – Do you have your own laptop? Will you use one from your department or check one out from Media Services?

  Be sure the laptop you will be using is outfitted with the appropriate software. This can be done at your Media Services PRS orientation.

- ❑ ***Display*** – Your classroom will need a computer projector that can present your monitor screen for the entire class to see.

  Although two screens or white areas for projecting information (one for the PRS main display, the other for showing the question to be answered for all to see) would be ideal, that may not be possible in all classrooms. If you have only one display screen, that's okay. Using *PRS software*, pull the *Screen* menu down to select *Half Screen*. This will free up the lower half of your computer screen for displaying a question.

- ***Connectivity*** – To connect the PRS receiver to your computer you'll need either one open serial port or a USB/Serial converter to connect to your USB port.

  Because the USB/Serial converter requires Media Services to install specialized software on to the computer, it's doubly important to decide what computer you will be using ahead of time.

- ***PRS System*** – This includes both the handheld devices students will use and the transmitters that will be set up to receive the signals.

  There are receivers permanently installed in four classrooms on campus, 180 PLC, 123 Pac, and 100 Willamette. The handheld transmitters students use to submit their answers need to be reserved through Media Services. The portable unit, also reserved through Media Services, comes with both the transmitters and receivers ready for set-up and use.

"The learning process is something you can incite, literally incite, like a riot."
-Audre Lorde

Media Services Orientation – What do you need to bring and what do you need to ask?

- ***Computer*** **–** If you're not using one from Media Services, you'll need to bring along the laptop you intend to use so it can be set up with the appropriate software.

- ***Sample Questions*** **–** During this orientation you will learn how to set-up and use the PRS software. Bringing along some sample questions will give you something to practice with.

- ***Class Location and Time*** **–** Media Services will need to know where and when to deliver and pick up the equipment.

- ***Questions about Using the Equipment*** – If you don't know, ask somebody! You should feel comfortable asking Media Services about the delivery, set-up and use of the both the PRS software and the laptop system. By the end of the one-hour session, you should feel confident that both you and Media Services agree on the process.

Developing the Activity – Think pedagogically and plan technologically!

- ***Writing the Questions*** – Many users prepare questions in their favorite word processing or presentation application, and position the windows so that both the PRS main display and the question file are visible.

  The PRS software also provides a built in method for creating and using question files, using an editor that meets the basic text editing needs of many users.

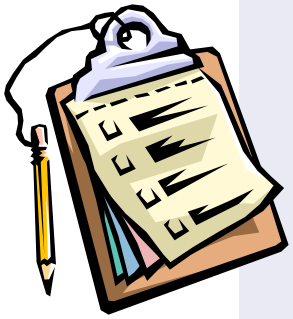
  When developing your questions you'll want to think about how they will fit the technology. Some things to think about include:

  Choices – The PRS software allows the instructor to select the number of answer choices students have in response to a question. For each question asked, the number of available choices for the students to answer must equal or exceed the actual number of multiple choices in the question.

Remember that students submit their answers using a numerical keypad. Be sure when writing your questions that you identify answers using numbers. For example:

1. What percentage of the world's total water supply is fresh, accessible water?
    1. less than 1%
    2. 5%-10%
    3. 25%
    4. 50%

Chances - For pedagogical reasons, there might be a need to allow the students to answer only once or a few times. To impose this, the PRS software allows you to select the desired limit.



- ***Develop a Back-up Plan*** – The question should never be, "What am I going to do **if** this doesn't work?" Ask, "What am I going to do **when** this doesn't work?"

  Systems fail, machines crash, software and files corrupt. If you deal with the possibility ahead of time, when the situation arises, you can simply go with the flow. Your students will understand and flow with you.

- ***Plan for the PRS Set-up Time*** –The PRS set-up time can take 10-15 minutes depending on the room, so you may need to plan something for that time. Students could be doing a small group activity, short writing assignment or having a group discussion.

Implementation

- ***Distributing the Handheld Devices*** **-** Transmitters can be distributed in various ways to suit particular applications. Often times, students can pick up transmitters from a box as they enter the classroom. Units are returned to the same place when they leave. Developing a plan for efficient distribution and collection of the handhelds is important.

- ***Number of Students*** **–**It may not be necessary, or possible, to have every student using a transmitter. This may even be a good thing. In larger classes, consider grouping students, having them discuss the question posed and register one response for the group consensus. These types of activities help build collaboration and a sense of community into the large lecture setting.

- ***Transferring Questions to Classroom Computer*** **–** Not every computer is equipped with the same input devices. You'll need to know ahead of time what drives the classroom computer is going to have and what storage medium you can use to transfer the question file for use on this computer.

  You'll also want to think about compatibility between computer platforms. Mac users need be aware that the Windows operating system uses a three-letter extension at the end of every file name. If you are developing your questions using your Macintosh, remember to add that three-letter extension to help ensure that Windows can read the file.

  Similarly, you'll need to transfer the file using PC formatted storage media, a PC Zip disk for example. The good thing is, the Macintosh will read PC formatted disks and files so transfer between the two platforms can happen smoothly.

"Teachers are those who teach us not for a written test, but rather for the final exam called life."

-Author Unknown

Selected Online Resources

Interactive Lectures Interest Group (ILIG)
Steve Draper
http://www.psy.gla.ac.uk/~steve/ilig/
A wealth of excellent information. Of particular interest may be the sections under the heading of "more detailed issues in designing and conducting sessions with handset questions."

Electronically Enhanced Classroom Interaction
Steve Draper
http://staff.psy.gla.ac.uk/~steve/handsets/handsets.html
Extensive discussion of uses of the PRS.

Who Wants to Be…The Use of a Personal Response System in Statistics Teaching
Dr. Ernst Wit
http://ltsn.mathstore.ac.uk/newsletter/may2003/pdf/whowants.pdf
Extensive discussion of the use of the PRS system in a statistics course.

Using a Personal Response System in Economics Teaching
Caroline Elliott
http://www.economics.ltsn.ac.uk/iree/i1/elliott.htm
Describes the use of PRS in a micro-economics class.

Improving Student Interaction Via a Personal Response System and Peer Instruction
Bill Madill
http://www.be.coventry.ac.uk/BPBNetwork/casestudy/uce_tla3i.htm
Introduces uses of the PRS system in an Architecture class.

Extending the Personal Response System (PRS) to Further Enhance Student Learning
Joan Wines and Julius Bianchi
http://www.ssgrr.it/en/ssgrr2002s/papers/159.pdf
Overview of the PRS and how it can positively impact student learning. More conceptual than hands-on.

A Universal Learning Tool for Classrooms?
Nelson Cue
http://celt.ust.hk/ideas/prs/pdf/Nelsoncue.pdf (downloads as a PDF file)
Focuses on the positive reactions that students had to the use of a PRS system.

Report on the Personal Response System
Kevin Hinde
http://www.psy.gla.ac.uk/~steve/ilig/papers/hinde.pdf
Paper written to evaluate possible purchase and use of the PRS.

Ocotillo Retreat 2003
http://www.mcli.dist.maricopa.edu/ocotillo/retreat03/prs.php
How Maricopa Community College used PRS units to kick-off a staff retreat.