

TO: CC-FIT
From: Educational Technology Sub-committee
March 14, 2005

RE: Personal Response Systems (PRS)

A new technology is on the horizon. Personal Response Systems bring the promise of revolutionizing classrooms large and small by allowing the instructor to assess students' knowledge, opinions, and reactions.

Instant assessment through the use of a PRS has the ability to address many pedagogical issues.

1. Attendance and Attention. As the students can register their PRS with the instructor, the faculty can choose to track student answers and grade on participation each day. There is both anecdotal and systematic data that suggests that students are more engaged and attentive when they are required to respond to the content material. There is also anecdotal data suggesting that when an students are accountable for class participation, class attendance increases.
2. Assess understanding or misconceptions. The PRS system allows faculty to shorten the gap between the time the students are presented with a concept and the time that the students receive valid feedback on whether or not they understand that concept. Faculty using PRS can identify and address common student misconceptions regarding presented material. Identifying students' satisfactory understanding of a topic can free up faculty to focus or expand lectures appropriately.
3. Stimulate Discussions. PRS can be used very effectively to stimulate discussions, to generate hypotheses, and even to gather data. These activities allow the students and faculty to engage in a dynamic exploration of a topic where all parties are invested in the process.
4. Working in groups. PRS can stimulate group work and peer instruction. Again, making the student responsible for a recorded answer elevates the attention to the activities in the class. Students may be interested in others' scores, the mean score, the possibilities for competition, etc.

Technical Issues and Background:

The currently available PRS mostly use infra-red (IR) technology to transmit the signal from the student hand-held response pads to the instructor's receiver(s) and computer. The primary limitation of this technology for our use is that in classes with more than ~60 students, multiple receivers are required. These multiple receivers need to be installed throughout the classroom, usually near the ceiling, as they require line-of-sight connection with the student response pads.

A number of the vendors are currently working on systems that would employ Radio Frequency (RF) technology. It is expected that with RF devices, a single receiver the size of a thumb drive would be sufficient to gather responses from up to 500 students at a time. This receiver would also not require line-of-sight, so it could simply be plugged into the instructor's computer, making the system completely portable.

Classroom Technology Services and the Office of the University Registrar are reluctant to semi-permanently install IR receivers in classrooms at this point. There is no clear 'best of breed' product, and the technology is changing rapidly. This is not a time to make a large-scale investment into outfitting classrooms with these systems. However, if the vendors do deliver on the RF models, then allowing faculty to experiment with this technology is essential. Clearly this technology has much to offer the learning process, particularly on a campus where large lectures are the norm and the classrooms are getting larger! Once appropriate portable systems are available for our larger lecture halls (200+ students), then faculty should be free to take advantage of this dramatically useful tool.

The Educational Technology Sub-committee of CC-FIT would like to recommend the following course of action.

1. Identify all RF systems available as of June 1, 2005
2. Evaluate RF systems for use in our classrooms, and identify the single most viable hardware and software
3. Purchase six faculty receivers.
4. Order and subsidize 1200 student response pads to be sold through the bookstore. The average price to student currently is \$35-40. We propose subsidizing this to reduce the cost to each student to a maximum of \$20.
5. Place the faculty receivers on quarterly check out status for 2005-6. The TRC will coordinate a call for proposals from interested faculty, and CTS would handle the physical inventory.
6. The six instructors each quarter would require students to purchase the response pads through the bookstore.
7. The students would register their response pad ID number online.
8. The students could sell their response pad back to the bookstore at the end of Fall and Winter Quarter (and Spring Quarter if the program is sponsored for another academic year). The bookstore usually buys used equipment back at 50% of initial cost and then resells at 75% of initial cost.

Needs:

1. technical evaluation of RF systems (Rick Sprunger – CTS)
2. pedagogical evaluation of software (Tor Cross – TRC)
3. funding to subsidize student purchase (1200 clickers @ ~\$20 each = \$24,000)
4. funding to purchase faculty receivers and associated software. No cost estimate at this time. Many manufacturers will provide the receivers free of charge as the business plan relies on sales of the response pads.