PRS - Six Years Following its Introduction

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Drawbacks of One-to-Many Lecture:

- Learning needs inspiration, big or small, and inspiration cannot be scheduled.
- Lack of interactivity

Remedies:

- Small class - use Socratec dialogue.
- Large class - use interactive engagement of Q&A’s and a classroom learning tool like the PRS (allow peer instruction and contingent teaching)
Introduced PRS

It is a wireless response system based on the IR technology:

• that allows each and every member of the audience to respond privately to a question or prompt,

• each and every response is registered in a PC

• the results are summarized and displayed instantaneously for all to see.
A one-way or single-channel communication network utilizing electromagnetic radiation signals of a fixed single or narrow-band frequency in free air space consists of a plurality of transmitters and a central receiver in which each message is encoded in a wave train and is tagged with a sender identity (ID). The central receiver, which can be a single unit or a plurality of units connected in cascade, detects the messages in the free air space and send them along to a central processing unit (CPU) for message handling. Possible additional features of the system are: an option of a small display panel on the individual transmitter to show the message to be sent plus the number of attempts a message was sent within a preset time; a separate feedback segment, such as a colour change of a characteristic symbol on a central display screen visible to the sender, providing a confirmation that the message has been received; each symbol on the display screen showing the number of times a message was received from the corresponding transmitter within a present time; and a built-in option to either retain or black out the ID tag on the messages to be processed by the CPU. The free forming aspect of the system stems from the portability of the ID-encoded transmitters which enables any combination of transmitters to form a communication network, and a plurality of such combinations to form a plurality of networks.
How Effective and Universal is PRS?

In Yr-1 Mechanics, Hake showed interactive engagement more than doubling the measured learning based on standardized test results.


\[ g = \frac{\text{post\%} - \text{pre\%}}{100 - \text{pre\%}} \]

Fig. 2. Histogram of the average normalized gain \( g \): dark (red) bars show the fraction of 14 traditional courses (N = 2084), and light (green) bars show the fraction of 48 interactive engagement courses (N = 4458), both within bins of width \( \delta g = 0.04 \) centered on the \( g \) values shown.
Partial List of PRS Users in N. America
Arizona State University
California Polytechnic State University
California State University, Fullerton
Cooper Union
Cornell University
Dartmouth College
Duke University
Florida State University
Harvard University
Harvard Business School
Illinois Institute of Technology
Indiana University
Iowa State University
Kansas State University
Lake Forest College
Massachusetts Institute of Technology
Michigan State University
Minnesota State University
North Dakota State University
Northeastern University
Notre Dame
Old Dominion University
Oregon State University
Rice University

Rutgers University
Stanford University
Universidad Central del Caribe (PR)
University of Arizona
University of British Columbia (Canada)
University of California, Berkeley
University of Illinois, Urbana-Champaign
University of Kentucky
University of Maryland
University of Massachusetts, Amherst
University of Minnesota, Duluth
University of Nebraska-Lincoln
University of Nevada, Las Vegas
University of North Carolina, Ashville
University of Pennsylvania, Philadelphia
University of South Florida
University of Tennessee
Vanderbilt University
Wake Forest

Other regions
Scotland: University of Glasgow
           University of Strathclyde
HK: Baptist U, HKU, HKUST, PolyU
South Africa, Israel, Germany, Italy, Greece, Turkey, Australia, Indonesia and China.
HKUST Students Survey2 - 2000

Do more thinking in PRS classes

AgS-Ag-N-Dg-DgS

Mgto321-2
Mgto321-1
Phys002
Phys001
Knowing the responses of classmates increases my interest.
HKUST Students Survey 4 - 2000

PRS helps me learn in greater depth

AgS-Ag-N-Dg-DgS
‘What was, for you, the balance of benefit vs. disadvantage from the use of the handsets in your lectures?’ [Comp Sci]

S. W. Draper & M. I. Brown,
Journal of Computer Assisted Learning 20, pp81–94
“Responses to the net value question in assorted other classes.”
North Dakota State U:

The NDSU pilot PRS project produced good survey results:

To "I do more thinking during PRS classes than in lecture classes," 82.1% respondents agreed or strongly agreed.

To "some PRS questions make me try hard to make sense of the subject matter," 89.7% agreed or strongly agreed.

To "I prefer the more traditional lecture approach over the newer PRS approach," 91.4% disagreed or strongly disagreed.

Survey Results from Dr. Jeffery Gerst
Recent developments:

- Java version SW that complemented the original VB version
- multi-media questions
- separate display windows for students and instructor
- option for numerical answer
- option for self-paced test taking
- distribution through book stores
- Publishers producing textbooks with MC questions and bundling either a PRS handset or a handset rebate coupon with the textbook.

The last two points

- minimize the cost to the institutional users.
- eliminate the need for distribution/collection of handsets.
Ultimate Questions: Thinking About Philosophy

Nils Ch. Rauhut, Coastal Carolina University

For Philosophy

Allyn & Bacon/Longman CourseCompass Instructor QuickStart Guide, 3/E
by Robert Allyn & Bacon

EduCue Personal Response System
by EduCue, Robert Allyn & Bacon
© 2005 | Electronic Supplement | ISBN: 0205436951 | Status: Not Yet Published; Estimated Availability: 05/01/2004

Increased Interactivity * Higher Attendance * 100% Participation

Assess your students' progress with the EduCue Personal Response System — an easy-to-use wireless polling system that enables you to pose questions, record results, and display them on a classroom screen.

Our partnership with EduCue PRS allows us to offer student rebate cards bundled of $20.00 and can be redeemed with the purchase a new PRS student transmitter.

order 40 or more new textbook + rebate card bundles will receive the classroom receiver—a $250 value—software and support for FREE.

In addition, institutions that order 40 or more new textbook + rebate card bundles will receive the classroom receiver—a $250 value—software and support for FREE.

Contact your Allyn & Bacon / Longman representative for more information on our classroom response systems.
Summary 1:

PRS is a tool for active learning in the classroom

- 100% participation in Q&A sessions;
- instant feedback & reinforcement;
- automatic attendance check;
- automatic recording of answers;
- check understandings;
- challenge shy students;
- gender-blind responses;
- color-blind responses;
- facilitate peer instruction;

PRS is a tool for electioneering, for instant polling and for rating by audience

- in training sessions for immediate feedback and reinforcement;
- in elections for instant tabulation of votes;
- in new product demos for on-the-spot opinions;
- in contests for rating by audience.
Summary2:

Feedback to teacher for contingent teaching
PRS become as common as a pen & paper sets?

A side issue – an old lesson re-learned

- There is a S-curve for the adoption of any new device/approach
- PRS - commercially available and first campus-wide adoption in 1998.
- A useful device like the PRS still took 5.5 years to be at the rising slope of the S-curve.
- The incentive of being recognized as a good teacher is insufficient if the perceived “barrier” for the effort is large
- The key factor in lowering this “barrier” is the recent availability of textbooks with MC questions