The evolving classroom response system at Kansas State University:
Classtalk, PRS, & PDAs.

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Response System in Physics at KSU: The Last 10 Years

- Primarily in introductory courses
- Variety of class sizes
  - 15 to 180 students
- Mostly for in-class feedback on conceptual understanding
  - Essentially no testing with systems
- Some (not all) faculty provide credit for use
- About ½ faculty have used system at least once

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Classtalk (1995 – 2000) Hardware

- Designed & Built by Better Education Inc.
  - http://www.bedu.com/
- Hard wired proprietary network
- Macintosh Server
- Hewlett-Packard Hand-held *DOS* computers
  - Full QWERTY keyboard

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Classtalk Software
Designed & Written by Fred Hartline

- Mac server
  - Sends questions to handhelds
    - All types of questions possible
    - *Not* limited to multiple choice
  - Provides analysis & individual responses for instructor
  - Could send different messages to handhelds depending on the student's response
- Handhelds
  - Full questions appear on screen
  - Alphabetic & numeric responses possible

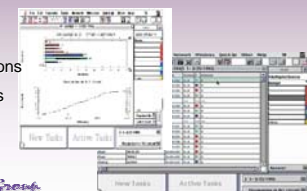*Physics Education Research Group*

Classtalk Software

Includes seating chart with ability to click on a seat and see the student's name, picture and response.
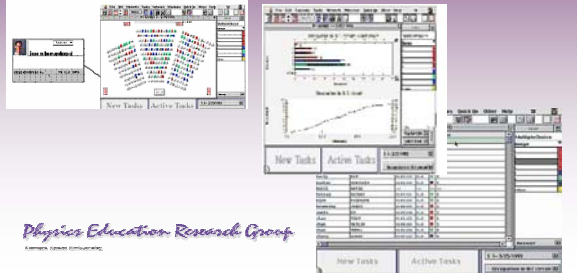
Analyses include
- Parsing for short answer questions
- Binning for numerical responses
- Histograms for multiple choice

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Better than any software for later systems

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Assessment of Student Learning*

- Completed in conceptual physics course for elementary education majors
- Three classes
  - Before Classtalk was installed
  - Classtalk installed about mid semester
  - Used Classtalk entire class
- Common final exam
- Attitude surveys
- Results show positive effects in both learning & attitudes

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*David Johnson: unpublished MS Thesis

Personal Response System (PRS) 2001 Onwards

- Infrared (wireless)
- Remote clickers
- One way communication
  - No "server" just a receiver
- Multiple choice only
- Relatively inexpensive
- Many other similar systems

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PRS

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Personal Data Assistants (PDA) 2004 Onwards

- Wireless Internet
- Full "keyboard" available
  - No limits on types of responses
- Web-based software
  - Can run in browser
    - Not all functions of desktop browsers
  - Any Web-based question-response system can work
- Expensive ~$500-600 (Cheaper models available)
  - Thanks

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2

PDAs

- Explored several options for software & responses
- Used in only one class
  - Elementary ed majors
  - Attempted to develop uses beyond previous systems
  - Instructor (DZ) experienced with Classtalk & PRS

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Beyond Question
http://www.erskine.edu/bq/

- Server at Erskine College
- Multiple choice and open ended Questions
- Can be used with simple "clickers" as well as PDAs and computers.
- Creation of question set relatively easy.
  - Can include graphics
- Free for non-commercial use

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Beyond Question
Examples of instructor response screens

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KSU Survey System
http://survey.ksu.edu

- Created for social science research
- Variety of questions types
  - Multiple choice
  - Ranking
  - Scaling
  - Open-ended
  - Can include graphics
- Branching based on previous answer
- Grouping of questions
- At present use limited to KSU faculty

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Survey System
Examples of Instructor Screen

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Ideas for PDAs Classroom use

- Neighboring students receive slightly different questions
  - Same topic
  - Required to discuss with each other after answer
    - Consider similarities and differences in situation and responses
- Graphical questions
  - Point to a place on the picture that ...
- Students use PDAs as measuring tools
  - E.g. stop watches
- Web as a reference source

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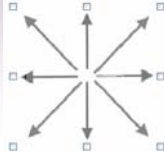
Different Questions with Graphical response

• Each students sees a picture of a diver after she has left the board

•Three students sitting next to each other will have different pictures

  •On the way up

  •At the peak

  •On the way down

•They select vectors to indicate each force acting on the diver.

•Subsequent peer-to-peer discussion addresses the "force in the direction of motion" issue.

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Issues

• Internet Explorer on PDAs is limited
  – Only one window open at a time
  – Java not implemented well
    • Macromedia Flash is but we have not used it yet
• Installing new software is done one machine at a time
• During class students will
  – Read e-mail
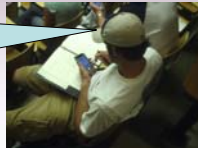 – Play games
  – Check bank accounts

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And they can check up on the instructor

I fixed the problem with the online grade book.

No, you didn't. I am looking at it right now.

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For more information

http://web.phys.ksu.edu/HP_project

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