

# Evolving Classroom Response Systems at K-State

From 'Classtalk'  
To 'Clickers'  
To Wi-Fi enabled PDAs

**N. Sanjay Rebello**

*K-State*

PHYSICS DEPARTMENT

*Physics Education Research Group*

Kansas State University

# Supported by



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**Office of the  
Provost, Kansas  
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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

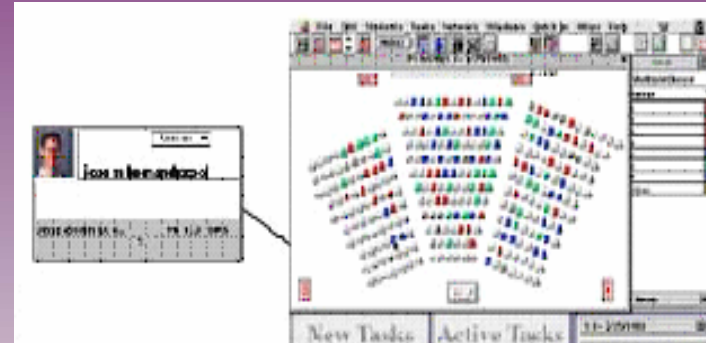
- Mac server
  - Sends questions to handhelds
    - All types of questions possible
    - *Not* limited to multiple choice
  - Provides analysis & individual responses for instructor
  - Could send different messages to handhelds depending on the student's response
- Handhelds
  - Full questions appear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

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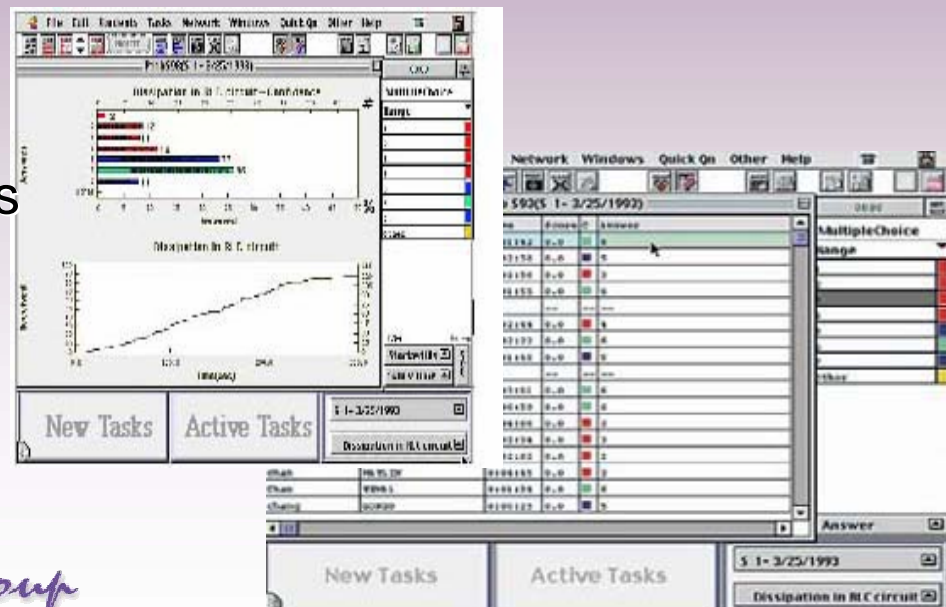
# Classtalk Software

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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# 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

# 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

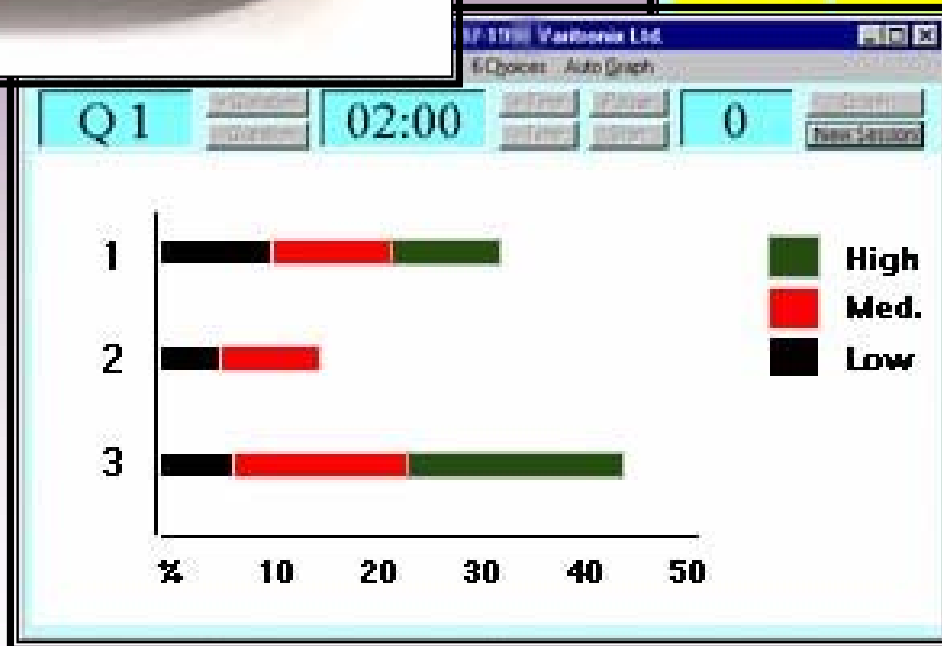


# PRS



Personal Response System - Copyright © 1997-1999 Veritronix Ltd.  
Elm: Audience: Fin: 30 Choices: Screen: 20 Lines: 6 Choices: Auto Graph

Q 1	02:00	0	New Session		
Aaron 1110	Fred 1122	Bill 1108	Eric 1144	Diem 1125	
---	---	---	---	---	
---	---	---	Pat 1144	---	
Louis 1115	Darcy 1199	---	---	---	



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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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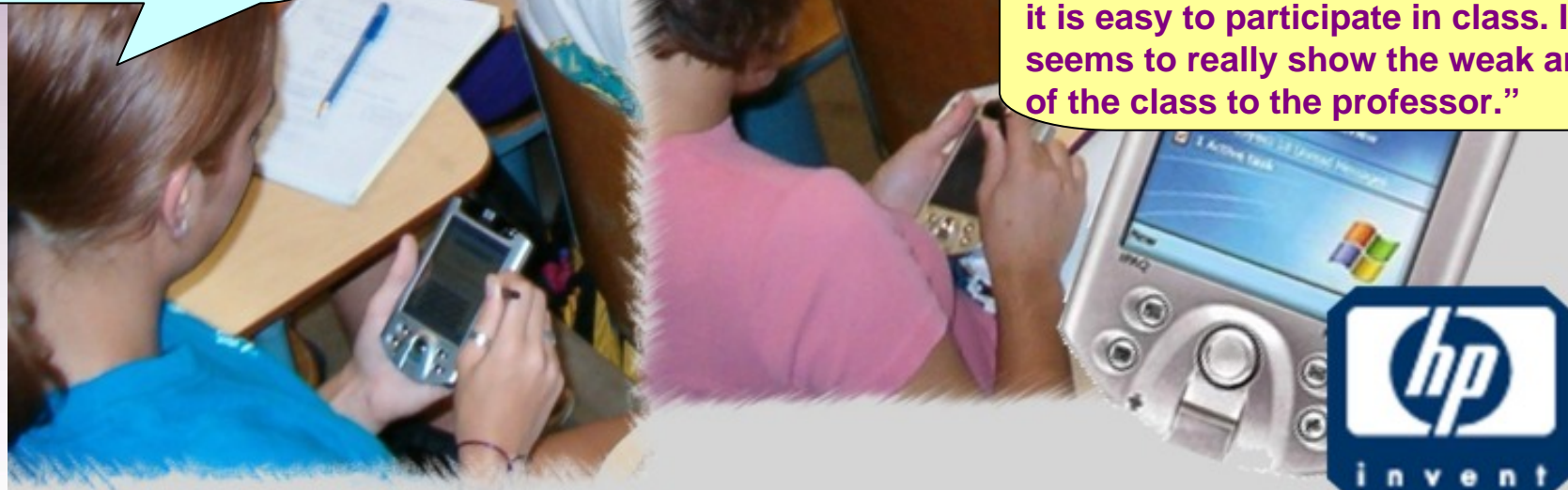
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K-State

"I love using these hand-held computers. I really like how it provides feedback directly to the teacher. I plan on getting one of these, for my own personal use."

"The best thing about the hand-held computers is that they provide useful feedback to the instructor about whether or not we understand"

"They are really easy to use and with the questions and response method it is easy to participate in class. It seems to really show the weak areas of the class to the professor."



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# PDA's

- Explored several options for software & responses
- Used in only two classes
  - Elementary Education majors
  - Functionality beyond previous systems
  - Server side software

# K-State InClass

<http://www.sciedures.org/inclass/>

- Wide range of Question types
  - Multiple-Choice
  - Open-ended
  - Ranking
  - Likert Scale
- Other features
  - Live commenting by students
  - Question sets
  - Branching: 2<sup>nd</sup> Question depends on answer to 1<sup>st</sup> question
  - Randomized Questions

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# K-State InClass Instructor View

Logged in as sanjay. [Logout](#)


Create New:     1234... 

## Prepared Questions:

- TestQuestions
- Exploration01
- Exploration02-ConceptIntro02
- Application02
- Exploration03-ConceptIntro03
- Application03
- Exploration08-ConceptIntro08
- Application08
- Application08-Continued
- Exploration09-ConceptIntro09
- Application09
- Application09-Continued
- Exploration10-ConceptIntro10
- Application10-Continued

New Session Name:

Of Course:

PHYS106 

[Start Session Now](#)

## Completed Sessions:

08-19-05   0819

*Physics I*

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# K-State InClass Instructor View

[back](#)

This offering spawned responses to

**Question:** 🌟🌟🌟 Q4: Predicting Wind

What is the direction of the motion?

- 1) It rises over land and sinks
- 2) It rises over the lake and sinks
- 3) It could be either.
- 4) Not enough info.
- 5) Don't know.



Pie Chart

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**Question:** 🌟 Q4-2: Predicting Wind Direction (51 responses)

Explain why air rises over land and sinks over the lake during the day?

radiation 2

convection 0

bhaverkamp: the land is hotter

asmith: the land is hotter

memills: the land is hotter

kheld: because the land is warmer than the water

lstrahm: because the land is warmer than the water

mrettig: dont know

jbelpnap: the land has more heat, so the air will rise over it

acarnahan: the land has more heat, so the air will rise over it

mmills: bc land heats up fast4r

cmccoy: bc land heats up fast4r

kberthold: bc land heats up fast4r

# K-State InClass Transcript

[back](#)

Course: PHYS106 Session: 1014

Date: 10-14-05

Students in Attendance:

[abillinger](#) [aboos](#) [aboos](#) [abrown](#) [abrown](#) [acarnahan](#) [acoup](#) [adav](#)

11:21:22 **\*\*\*SESSION BEGINS\*\*\***

11:25:27 1234... Q1: CONCEPTS OPENS ([18 responses](#))

11:33:54 jrose: "the application this week was incredibly long. it

11:33:56 1234... Q1: CONCEPTS OPENS ([143 responses](#))

11:37:44 1234... Q1: CONCEPTS OPENS ([146 responses](#))

11:38:50 kberthold: "gravity potential energy, conservation of ene

11:42:14  Q2a: Rank the Application Activities OPENS ([61 respons](#)

11:43:42 1234... Q1: CONCEPTS CLOSES

11:52:50  Q11: Old & New Poles OPENS ([70 responses](#))

11:52:52  Q2a: Rank the Application Activities CLOSES

11:58:09  Q11: Old & New Poles CLOSES

11:58:18 1234... Q10: Pole Vaulter OPENS ([118 responses](#))

12:07:40 1234... Q4: Sponge & Coin OPENS ([194 responses](#))

12:14:38 1234... Q4: Sponge & Coin CLOSES

12:14:44 1234... Q5: How to explain this OPENS ([122 responses](#))

12:19:12 1234... Q5: How to explain this CLOSES

12:19:17 **\*\*\*SESSION ENDS\*\*\***



# Issues

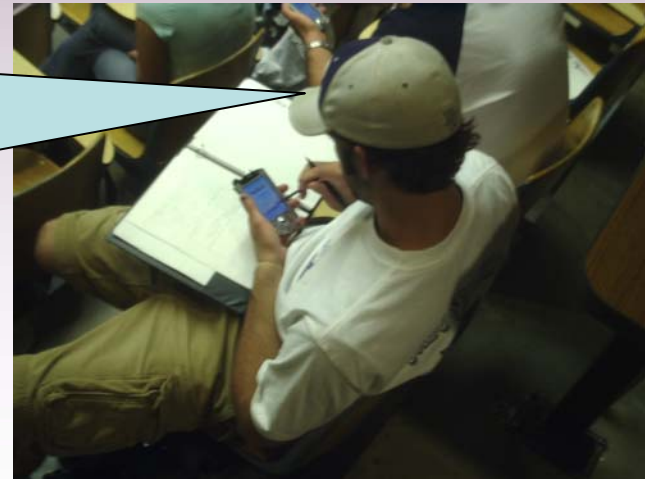
- Internet Explorer on PDAs is limited
  - Only one window open at a time
  - Java not implemented well
    - Macromedia Flash is but we have not used it yet
- Installing new software one machine at a time
- During class students will
  - Read e-mail
  - Play games
  - Check bank accounts

# 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.



For more information

[http://web.phys.ksu.edu/HP\\_project](http://web.phys.ksu.edu/HP_project)

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