"Clickers" in the Classroom: Analyses from the University of Wisconsin System Project
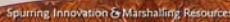
Robert Kaleta & Tanya Joosten

University of Wisconsin-Milwaukee
October 11, 2006
EDUCAUSE 2006 – Dallas, Texas
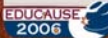
Session Overview

- Brief description of clicker grant project
- Brief description of clickers
- Evaluation findings
- Assessment findings
- Future research
- Clicker web site

University of Wisconsin System
Student Response System Grant Project

- 4 Campuses
- 28 Faculty
- 3500 Students

UNIVERSITY OF WISCONSIN SYSTEM

UNIVERSITY OF WISCONSIN
UWMILWAUKEE

Oshkosh

University of Wisconsin
WHITEWATER

University of Wisconsin
Eau Claire

"Clickers"

- Student response system
- Personal response system
- Audience response system
- Group response system

Tannen argues that all of the following are typical American "genderlect" patterns *except*

1. Men speak more than women during class
2. Women tell more jokes to be sociable
3. Women are more likely to use polite terms or phrases
4. Men talk more in public places than at home
5. All of these are typical genderlect patterns

Answer Now

48%
6%
17%
17%
17%

Men speak more tha...
Women tell more jok...
Women are more likel...
Men talk more in publ...
All of these are typica...
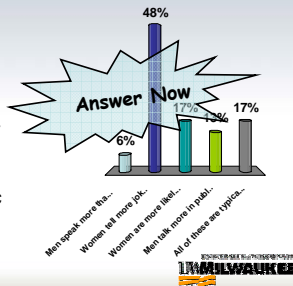
Clicker Project Goals

- Help a group of faculty integrate clicker use into their courses

- Develop a web resource on using clickers for teaching and learning

- Evaluate and assess the impact of clickers

Profile of Courses

- 28 courses
- 19 disciplines
  - From Accounting to Visual Art
- Experienced instructors
  - 93% had 6 or more years teaching experience
- Class size
  - Most were medium and large lecture courses
    - 50% of the courses had enrollments of over 100 students

Evaluation Data

- Student data
  - 61-item survey
    - Five-point Likert scale – Strongly Disagree to Strongly Agree
    - 2,684 student responses
  - 3 open ended questions
- Faculty data
  - 68-item survey
    - Five-point Likert scale – Strongly Disagree to Strongly Agree
    - 27 faculty responses
  - Five focus groups
  - Written narratives

Evaluation Findings

- Factors reported on in this presentation
  - Pedagogical opportunities
  - Engagement and participation
  - Student learning and performance
  - Future use
  - Satisfaction

Faculty -- Pedagogy

- **Faculty** felt that the clicker systems afforded them opportunities to implement new pedagogical strategies and that they were helpful in introducing active learning into the classroom

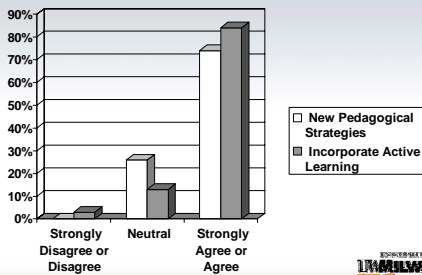## Faculty Responses -- Pedagogy

Faculty Comments -- Pedagogy

- "The clickers provided us another means for active involvement that was different, unique, and involved each individual student to some minimal extent."

Faculty & Students -- Engagement

- **Faculty** felt that student engagement, participation, and interaction increased as a result of using clickers in their courses

- **Students** similarly reported that the use of clickers increased their engagement, involvement, and interaction, and help students pay attention in class.

Faculty Responses -- Engagement
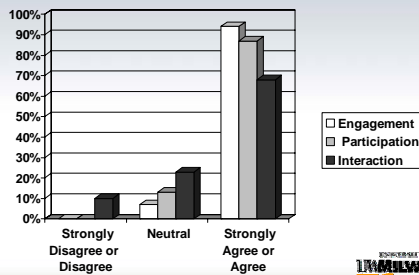
Faculty Comments -- Engagement

- "Attendance was dramatically improved with the use of the clickers. In addition, I was able to more successfully incorporate class discussion and alter lectures as needed."

- "The clickers were very effective in stimulating discussion....I think that seeing that range of opinions made the students a little more willing to talk about their opinions. "

Student Responses -- Engagement
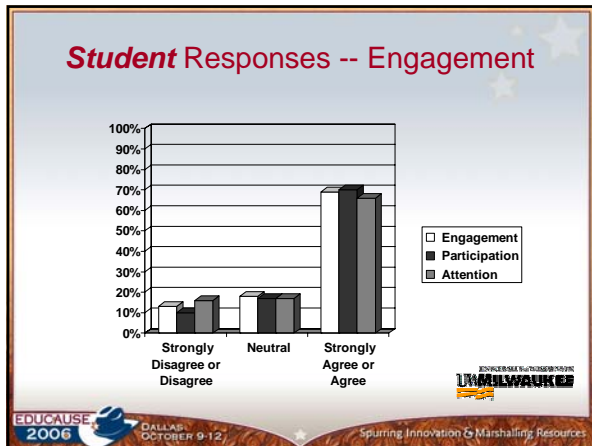
Student Comment -- Engagement

- "I liked how the clickers started discussions, especially if the question was especially difficult. The clickers also made me more active in class and they allowed the professor to use questions to prepare the students for his exams."

Faculty & Students -- Learning

- **Faculty** reported that the use of clickers provided them with knowledge on student mastery of course material and helped to improve student learning.

- **Students** appreciated the instant feedback provided by the clicker system and felt that the use of clickers was beneficial to their learning

Faculty Responses -- Learning

Chart showing percentages (0% to 100%) across three categories: Strongly Disagree or Disagree, Neutral, Strongly Agree or Agree.

Legend:
- Assess Knowledge
- Benefit Learning
- Increase Performance

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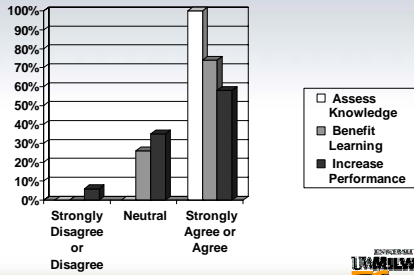
Faculty Comments -- Learning

- "By getting immediate feedback, I could judge whether students understood the basic concepts. If a vast majority answered the multiple choice questions correctly, then I could confidently proceed onto the next topic of lecture. If a large number of students did not get the correct answer then I could lecture some more and re-poll, or I could get the students to discuss amongst themselves what the correct answer should be."

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Student Responses -- Learning

Chart showing percentages (0% to 100%) across three categories: Strongly Disagree or Disagree, Neutral, Strongly Agree or Agree.

Legend:
- Feedback
- Benefit Learning
- Understand Material

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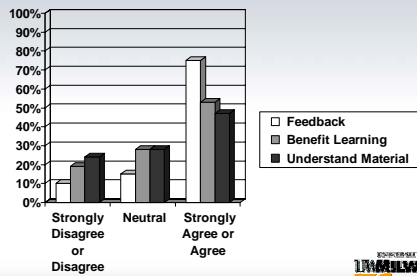
Student Responses -- Learning

- "I was able to check my understanding of the concepts and refer back to clicker questions when it was time to study for an exam."

- "[I liked] knowing where you stand in knowledge of material as compared to your classmates."

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Faculty & Students -- Future Use

- *Faculty* overwhelmingly reported they would continue to use clickers in their classes and recommend clickers to a colleague

- The majority of *students* would recommend that instructors continue to use clickers and would take another course that made use of clicker technology
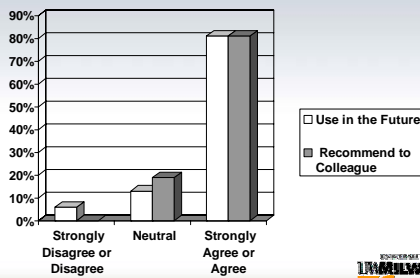
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Faculty Responses– Future Use

[Bar chart showing percentages from 0% to 90%]

Categories: Strongly Disagree or Disagree, Neutral, Strongly Agree or Agree

Legend:
- □ Use in the Future
- ■ Recommend to Colleague

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Faculty Comments– Future Use

- "I would like to encourage the use of this technology by more instructors…More importantly, I can see how this technology will help the university."

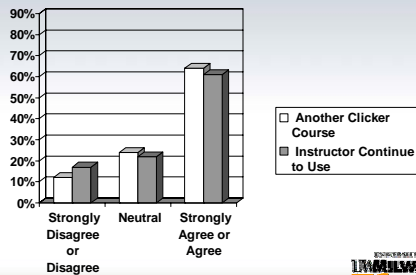## *Student* Responses – Future Use

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Student Comment – Future Use

- "I would take another course with clickers because along with taking notes and listening in lecture, the clicker questions help keep you involved and paying attention to the ideas that the professor thinks is important."

Students -- Satisfaction

- The majority of **students** reported that using the clickers in the course was fun, that clickers introduced a new and exciting way of interacting in the classroom, and that overall they were happy with using clickers.
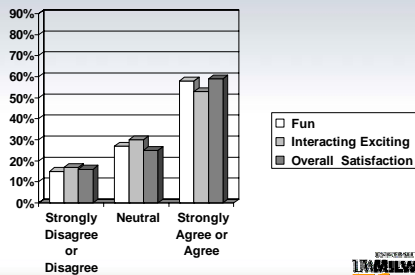

Student Responses -- Satisfaction

Legend:
- Fun
- Interacting Exciting
- Overall Satisfaction

Categories: Strongly Disagree or Disagree, Neutral, Strongly Agree or Agree

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Student Comment -- Satisfaction

- "They were a really fun and refreshing way to learn and participate in such a big lecture."

Assessment Data

- Dependent measures
  - Student retention
    - Drop and Withdrawal rates
  - Student grades
    - C or better
      - Descriptive analysis, % effect
    - Grade point for course
      - Recoding of letter grade for tests of statistical significance
- Independent variable
  - Clicker Use
    - Course criteria: same course, same instructor, fall semesters
      - Fall 2005: Clicker sections
      - Fall 2004: Non-clicker sections
    - 11 courses met criteria

Student Retention

- Analysis showed *no statistically significant* impact of clicker use on retention
  - Chi-square test indicates **no significant** difference between two groups (clickers and non-clickers courses)
- Descriptive analyses indicates a slight (1.34%) increase in course drop/withdrawal rate
  - Substantial variability among courses
    - 6 courses show a decrease in drop/withdrawal rates
    - 5 courses show an increase in drop/withdrawal rates

Student Grades

- Analysis showed *a **statistically significant** impact* of clicker use on student performance
  - T-tests of grade point percentages indicate **significant difference** ($p < .05$) between clicker sections and non-clicker sections
- Descriptive analysis indicate an increase of students obtaining a grade of C or better by 2.23%
  - Non-clicker sections
    - Grade of C or better 83.04%
  - Clicker sections
    - Grade of C or better 85.27%

Questions for Future Research

- As faculty become more experienced with clickers, what is the impact of clicker use on grades and retention?

- Is there a relationship between clicker use and other performance measures (e.g., student exam grades)?

- Is there a relationship between how clickers are used in a course and course retention and grades?

Summary

- Faculty were extremely positive about clickers
- Students were very positive about clickers
- No significant impact on retention
  - Great variability among courses
  - Further research needed
- Statistically significant impact on course grades
  - Some variability among courses
  - Further research needed

Student Response System Website

http://clickers.uwm.edu

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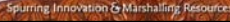
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