



Health Sciences Libraries
UNIVERSITY OF WASHINGTON

Click! Click! in the Classroom: Quick Assessment of Student Learning using an Audience Response System

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Goals

- Gain knowledge about using clickers for quick student learning assessment
- Demonstration of ease of use of clicker hardware
- Understand how to develop questions for the clicker system

<http://search.cbsnews.com/?source=cbs&q=clickers&x=13&y=12>

YOU'RE
WATCHING



CBS

A New Type Of School 'Click'

A new technological device known as the clicker has provided inspiring results in students. As Seth Doane reports, teachers and college professors are beginning to get clickers in the classroom.

June 8, 2008

Comments: 0



Replay Video

What are clickers?

- AKA audience response system or student response system
- Wireless response system that allows instructors to ask questions and gather instantaneous student responses during a class
- 3 components
 - Clicker
 - Receiver
 - software



How do they work?



- The instructor asks a question. The question is usually projected on a large screen in class.
- Students click their answers. The classroom computer registers all student responses in real-time.
- The instructor can instantly display a graph that shows how the class responded and discuss responses.

Who uses clickers?

- Variety of disciplines
 - Health professions, math and sciences, social sciences, business, engineering
- Clicker history
 - First used in Business for focus groups, employee training, and meetings
 - Educators discovered clickers in mid-1960's
 - Early 1970's: reports on usefulness of clickers in large classroom environments
 - Late 1990's : benefits of clicker use in large AND small classrooms

How are clickers used in teaching?

- Explore pre-existing knowledge
- Activate learning; engage all students in classroom; increase student involvement
- Instant feedback for teacher and students
- Assess student understanding
- Practice solving problems
- Identify attitudes, values, opinions
- Vote

Adapted from: Teacher & Educational Development, Univ New Mexico School of Medicine, 2007

University of Washington Case Studies

- Biology class experiment: large lecture (345 students)
 - Asked daily multiple choice Qs; half class with flashcard and half used clickers. Result: clicker group 95% attendance and card group 70%. High risk students performed better.
 - Now: starts class with review Qs from homework and previous lecture. Integrated 2-3 Qs about new material. Discusses and then polls again. Results usually 40-50% correct first time and 80-90% second poll
- Health Sciences: Medex, nursing, medicine
- Physics and other sciences

An Unexpected Use of Clickers for Library Instruction Assessment

Serendipitous discovery that clickers can be an effective tool for instructional assessment

- Original intention: add interactivity to instruction sessions and captivate student attention
- Found: provided valuable data on how students thought and were a useful measure of students' learning and opinions
- Authors began using clickers for instructional assessment

Julian, Suzanne and Benson, Kimball. Clicking your way to library instruction assessment: Using a personal response system at Brigham Young University. College and Research Libraries News 2008; 69(5): 258-61.

UW Health Sciences Libraries experience

- Received *21st Century Grant for Innovation, Service and Program Enrichment*
- Purchased 50 clickers, 2 receivers from Turning Technologies
 - Increased to 75 clickers and 1 more receiver
- Wrote basic instructions on use
- 4 computer classrooms at HSL set up for use
- Taught HSL library liaisons how to incorporate clickers into the classroom
- Reservations on Meeting Maker

Instructions for HSL liaisons

I Basic Steps for Using Clickers in the Classroom

1. Create an interactive PowerPoint (PP) slide
 - Click on the Turning Point (TP) icon on your pc. A non-interactive slide will appear (do not use regular PP).
 - Locate the TP toolbar on the top portion of the PP screen.
 - Click Insert Slide and select a slide type, i.e., generic slides.
 - Enter your question into the text box.
 - Enter responses, correct and incorrect if applicable, and press Enter after each potential response.
 - Optional: to add a level of control to your slide, click Insert Objects and select one of the reminder types, or a timer, etc.
2. Send slides to instructor station in Classroom C or LTL as an email attachment or using a USB drive.
3. Use in the Classroom
 - Get response devices and widget from Paul. Case 1: LTL, Channel 1 or Case 2: Classroom C, Channel 2
 - Insert widget. (In LTL, insert on left of monitor)
 - launch TP (icon on desktop, or Start> Programs>Turning Technologies>Turning Point)
 - open your TP PP via File>Open
 - To verify clickers are operational:
 - Click wizard on top bar (looks like lightning)
 - Uncheck vPad (leave Response card checked)
 - Next
 - Next
 - Change number of clickers (1 is correct; should change so 25 is end number)
 - Next
 - On window 'Start Polling Test or Finish' click Start Test, and try a few clickers
 - Finish
 - Open PP slides: Slide Show>View Show. You will now see Polling Open on

Costs: Turning Technologies order

- ResponseCard RF keypad: \$36/per unit > \$30
- ResponseCard RF receiver: \$199 each > \$99
- Carrying Case: \$50 each
- Site licenses for ResponseCard software (\$12/license for 50 students) > UW site license
- Support and Maintenance 1 yr: \$570 > UW site license

How HSL liaisons used clickers

- Incorporated into in-curriculum nursing classes with **pre- and post-tests** to assess student knowledge
- Guest lectures in the Information School to **engage students** in lecture content
- Pre-op library sessions for surgery residents to **assess their searching skill levels**
- Introductory lectures in Advanced **Social Work seminars** to assess real-time learning
- For HSL staff meeting for anonymous questions concerning **staff development**
- **Transported** out of the library, wherever we tote our laptops to teach



Clickers in the Classroom and Beyond:

Using Personal Response Systems to Improve Student Learning

Janet G. Schnall, AHIP, Amy L. Harper, Leilani A. St. Anna, AHIP, and Joanne Rich, Information Management Librarians, Health Sciences Libraries, University of Washington, Seattle, WA



What are clickers?

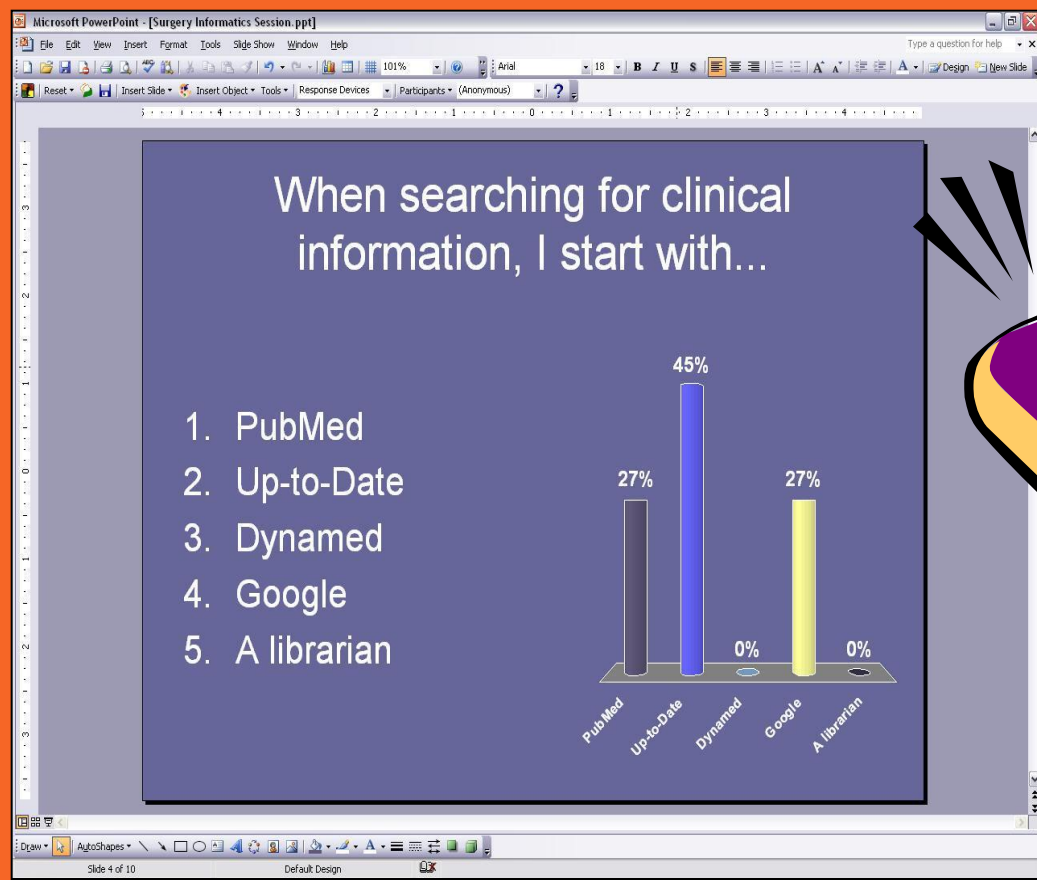
1. Audience response system
2. Allows instantaneous interactions between instructor and students
3. 3 components:
 - a. *clicker* (handheld transmitters) used by the students to send an answer or vote
 - b. *receiver* transfers responses to the instructor's computer
 - c. *software* on the instructor's laptop tabulates responses instantaneously in graph format

Background

1. Library received 21st Century Grant for Innovation, Service and Program Enrichment
2. Purchased 75 clickers
3. Taught library liaisons how to incorporate clickers into class presentations

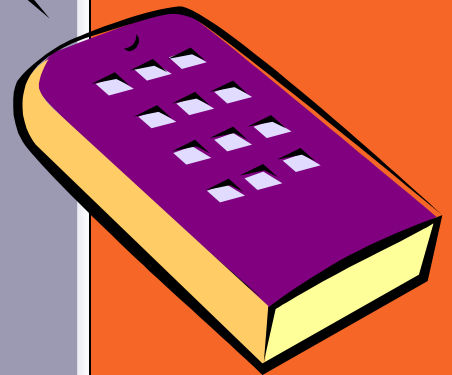
How are clickers used?

1. Incorporated into in-curriculum nursing classes with pre- and post-tests to assess student knowledge
2. Guest lectures in the Information School to engage students in lecture content
3. Pre-op library sessions for surgery residents to assess their searching skill levels
4. Transported out of the library, wherever we can tote our laptops to teach
5. Used for library staff development/education



Results

1. Provided real-time assessment for instructors on student knowledge and progress
2. Gave instant feedback for students
3. Successfully encouraged active engagement, attentiveness, and class participation in class content through anonymity
4. Provided information for the content of future classes



Challenges

1. Developing appropriate, thoughtful questions that allow students to apply their recently acquired knowledge
2. Increasing instructor flexibility in teaching style
3. Gaining familiarity with the software and equipment
4. Creating documentation to promote ease of use and consistency of practice

Our Results

- Provided real-time assessment for instructors on student knowledge and progress
- Gave instant feedback for students
- Successfully encouraged active engagement, attentiveness, and class participation in class content through **anonymity**
- Provided information for the content of future classes

Other reasons to use clickers

- For orientations, can create template with basic questions that other instructors can use
- Increase student attendance
- Discussion warm-up
- Peer instruction
- Safe way for shy, unsure, or ESL students to participate in class
- Training tool for scenarios and case studies to explore alternative solutions

The Value Of Clickers In Library Instruction Assessment

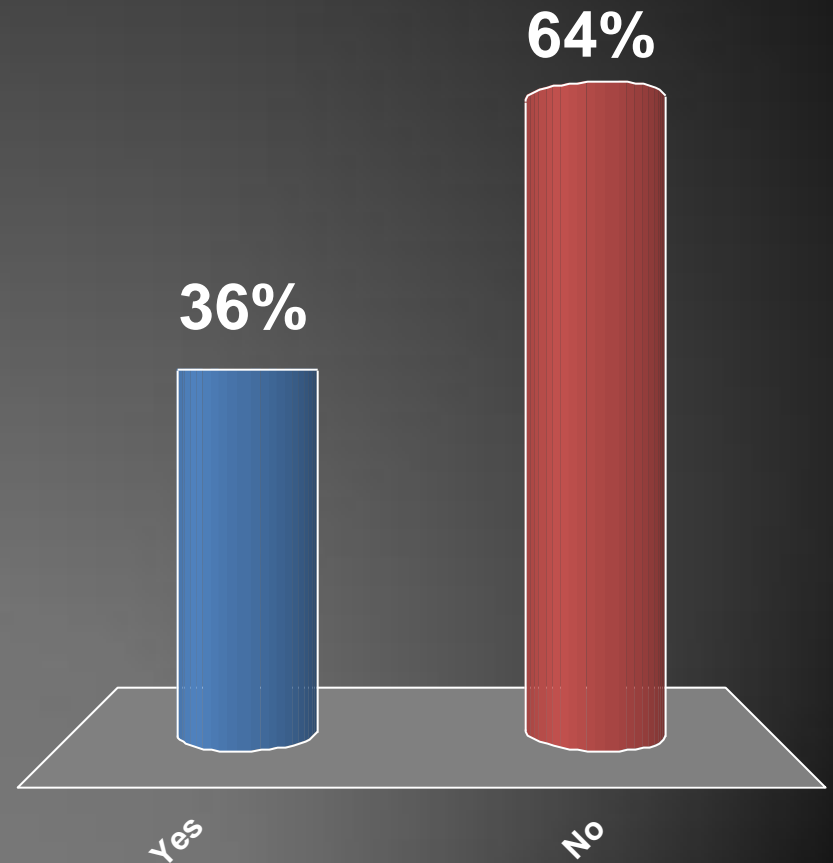
1. Assess Audience
2. Assess Background Knowledge
3. Assess Understanding of Concepts and Application of Critical Thinking Skills
4. Assess Teaching performance
5. Assess Students' Perception of Session

Adapted from: Blakeslee, Sarah. It's just a click away. Library Assessment Conference, Seattle, WA. August 2008.

#1: Assess audience

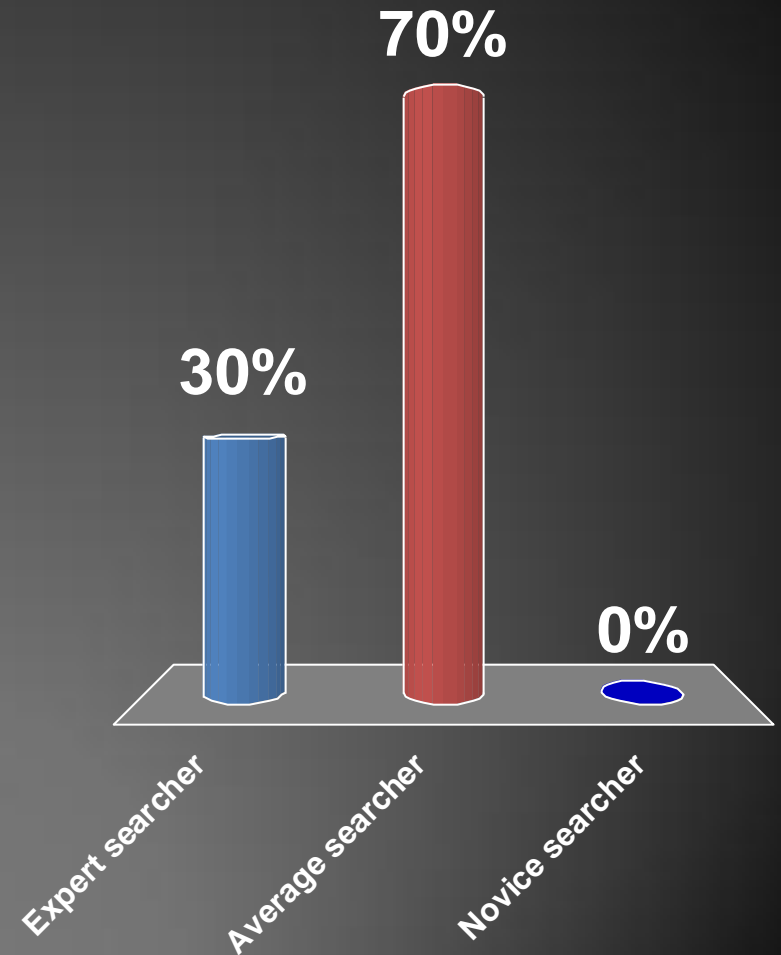
Are you new to UW?

1. Yes
2. No



I consider myself a PubMed

1. Expert searcher
2. Average searcher
3. Novice searcher



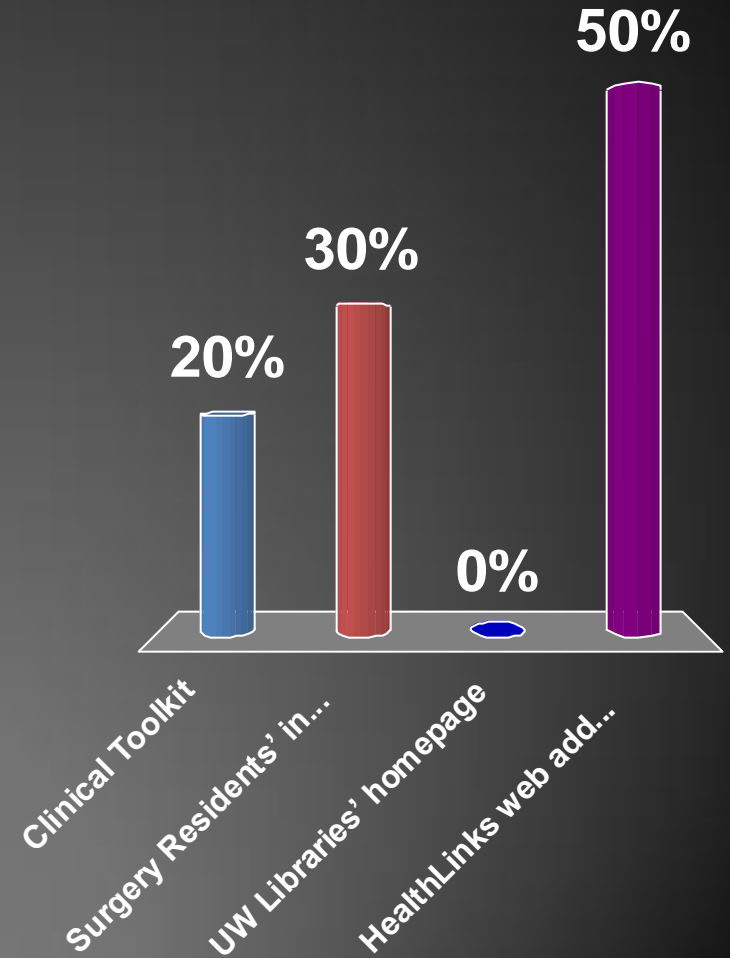
#2: Assess background knowledge

- Test background knowledge before beginning class
- Identify appropriate level of instruction

Surgery Informatics Pre-Op Session, January 31, 2008

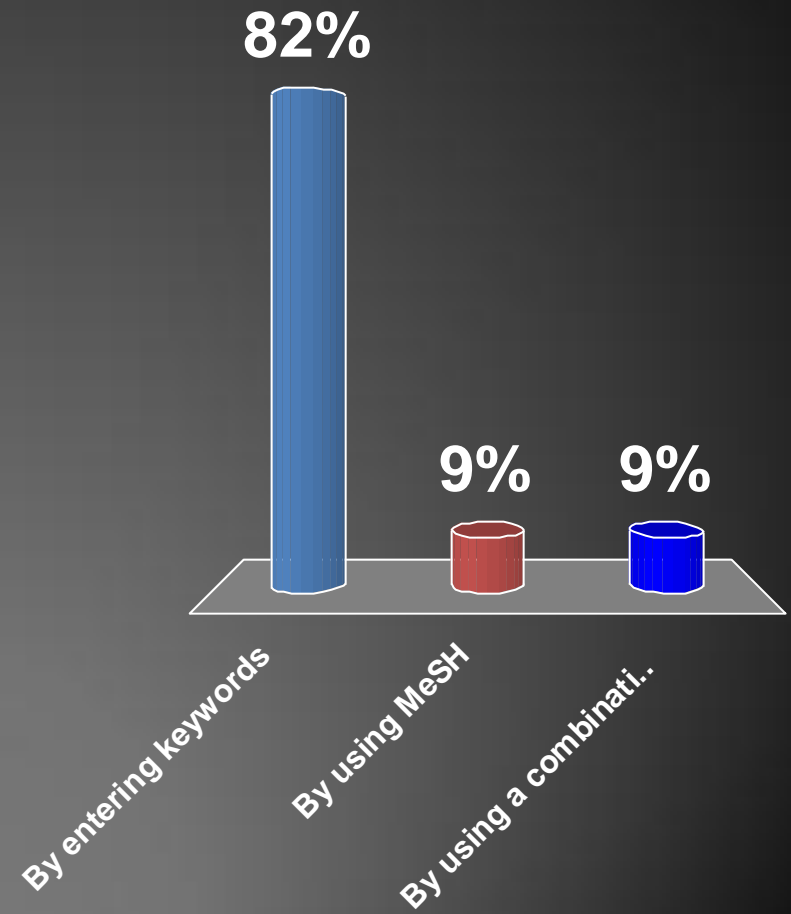
I access HealthLinks through

1. Clinical Toolkit
2. Surgery Residents' intranet
3. UW Libraries' homepage
4. HealthLinks web address



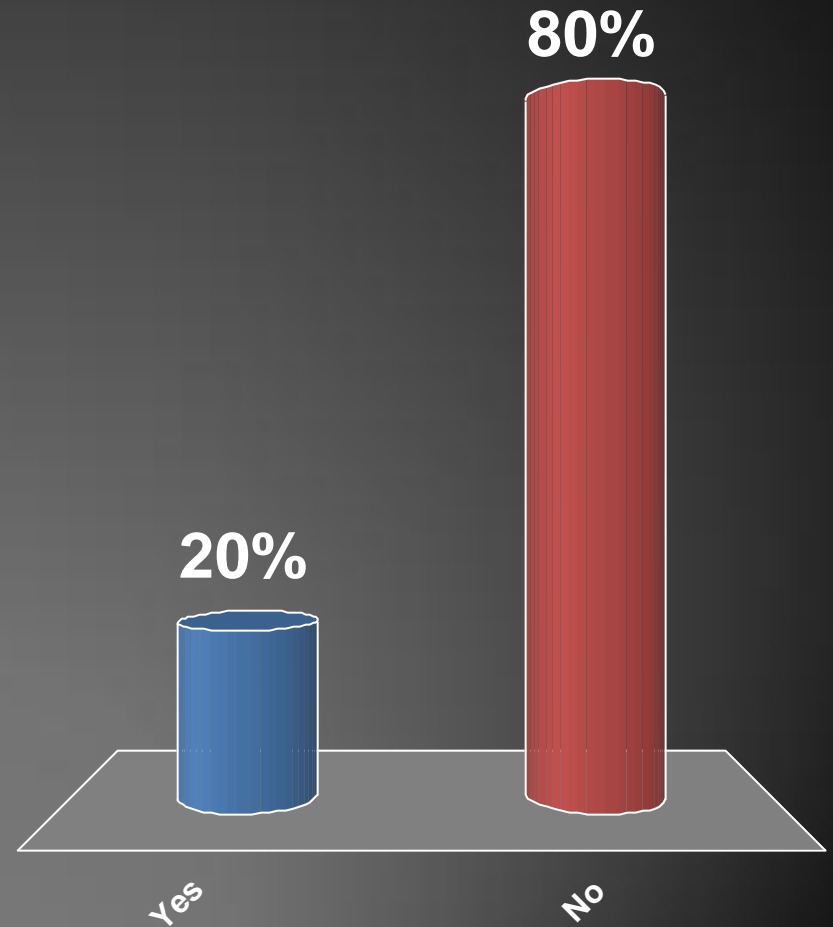
When searching PubMed, I start

1. By entering keywords
2. By using MeSH
3. By using a combination of keywords and MeSH



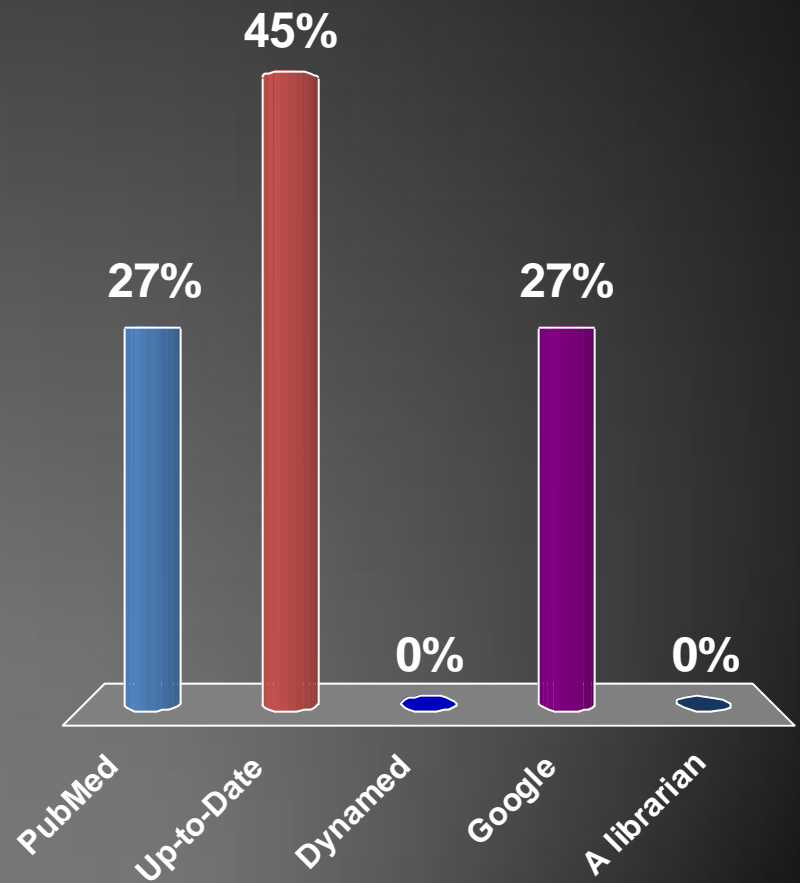
I know how to save search strategies and specific articles in PubMed

1. Yes
2. No



When searching for clinical information, I start with...

1. PubMed
2. UptoDate
3. DynaMed
4. Google
5. A librarian



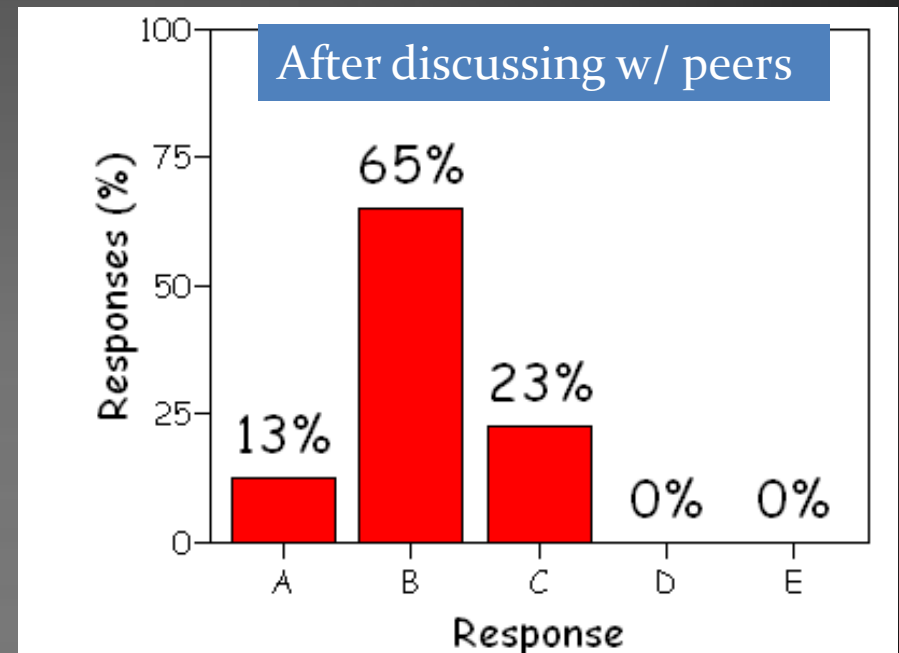
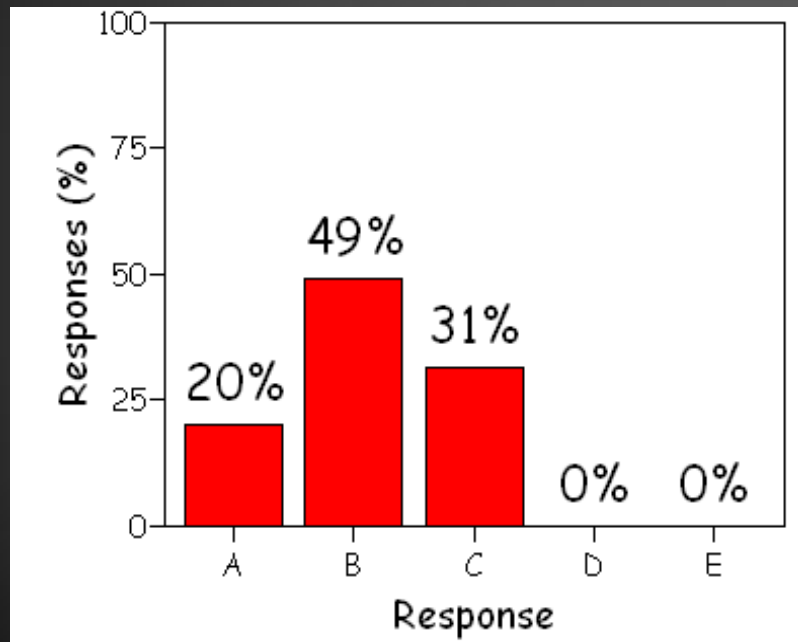
#3: Assess Understanding of Concepts and Application of Critical Thinking Skills

- Can assess in middle of presentation with prepared slides or “on the fly” slide
- Can change focus of class based on assessment
- Can assess at end of class

Example ConcepTest

A crate is moving to the right on a conveyor belt without slipping. The conveyor belt maintains a constant speed. The force of friction on the crate is

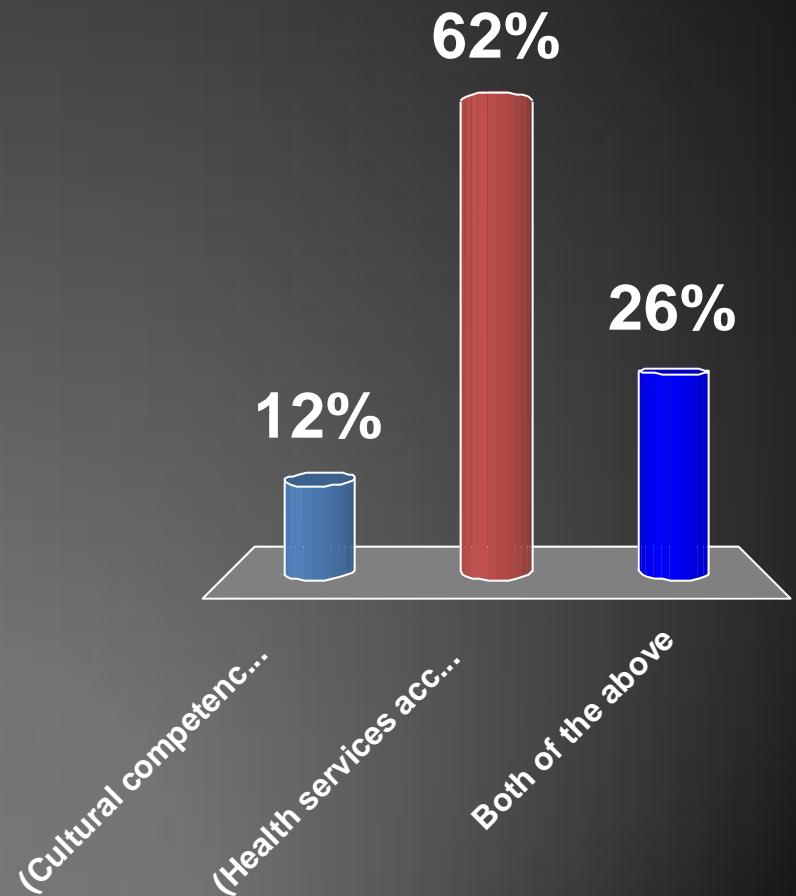
- A. to the right
- B. zero.
- C. to the left.



SW 598 Integrative Seminar July 25, 2008

Which is the best search strategy?

1. (Cultural competence OR cultural diversity) AND (cancer OR neoplasms) AND (oncologic social work OR transcultural social work)
2. (Health services accessibility OR health care delivery) AND (minority groups or ethnicity) AND (socioeconomic factors OR poverty)
3. Both of the above





Perceptions of health among immigrant Latino adolescents from Mexico.

[Garcia CM](#), [Duckett LJ](#), [Saewyc EM](#), [Bearinger LH](#).

University of Minnesota School of Nursing, Minneapolis, USA.

PURPOSE: This ethnographic study describes the health-related perceptions of immigrant Latino adolescents from Mexico.

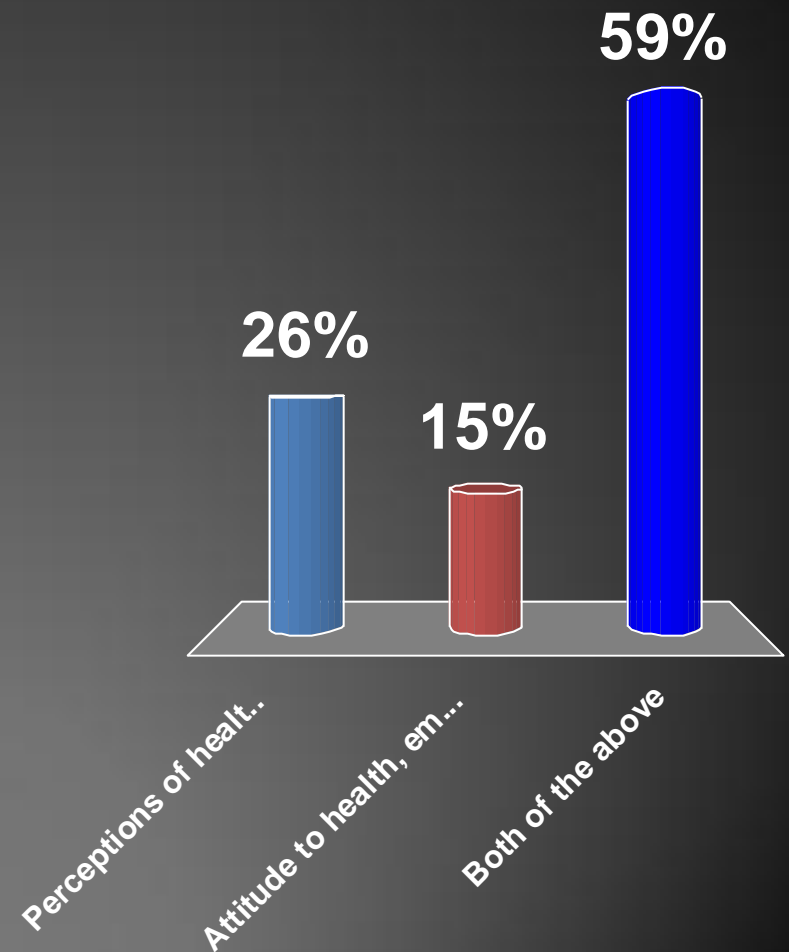
METHOD: Fourteen adolescents, purposively recruited from two non-health-based community settings, participated in semi-structured interviews and were interviewed twice and completed a visual narrative project using disposable cameras. Audiotaped transcripts and photographs were inductively analyzed. **FINDINGS:** Being healthy is holistically perceived by these adolescents and includes physical, mental, spiritual, social, and environmental factors. Pictures portrayed healthy and unhealthy influences and behaviors including eating habits, exercise, self-care, relationships, garbage, and pollution. Personal responsibility was important in being healthy and in promoting one's health. Family was identified as an important source of health-related information.

IMPLICATIONS: Nurses recognizing the holistic, comprehensive health-related perceptions of immigrant Latino adolescents can promote their health and design culturally and developmentally appropriate educational strategies and health interventions aimed at eliminating health disparities.

SW 598 Integrative Seminar July 25, 2008

Can you figure out the search terms for this article: *Perceptions of health among immigrant Latino adolescents from Mexico?*

1. Perceptions of health, immigration, adolescents, Latinos, Mexico
2. Attitude to health, emigration, adolescents, Mexican Americans
3. Both of the above



#4: Assess Teaching

- Provide teacher feedback to improve teaching practices

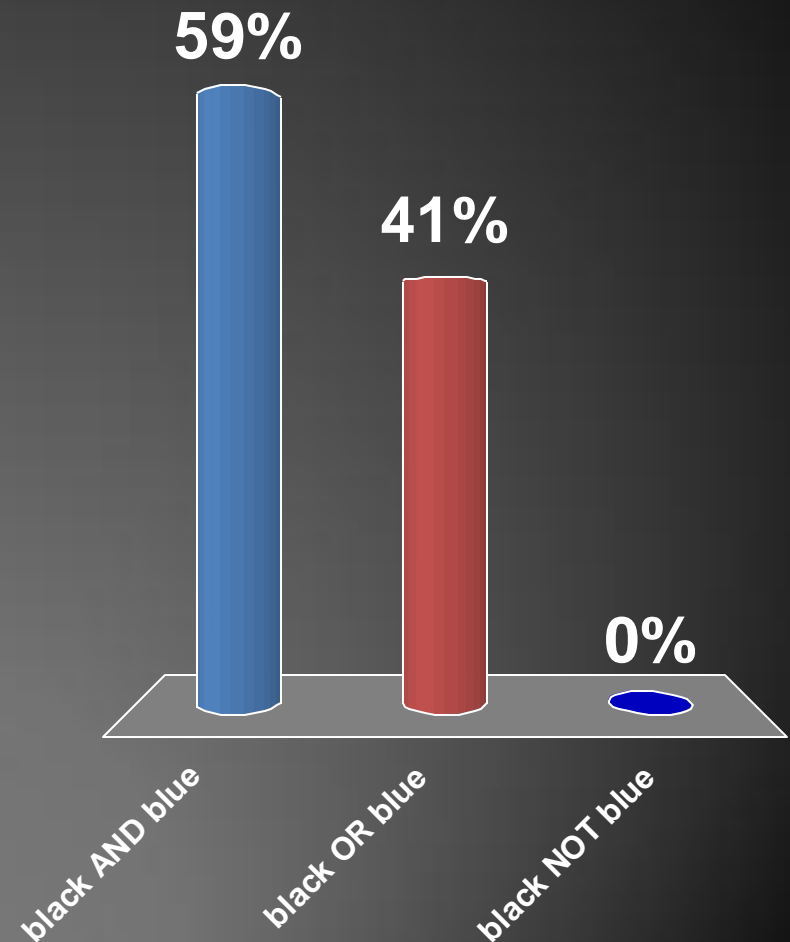
Nursing Methods 403 Autumn 2007 Pre-Test

When searching electronic databases, which search phrase will result in the most results?

1. black AND blue

2. black OR blue

3. black NOT blue



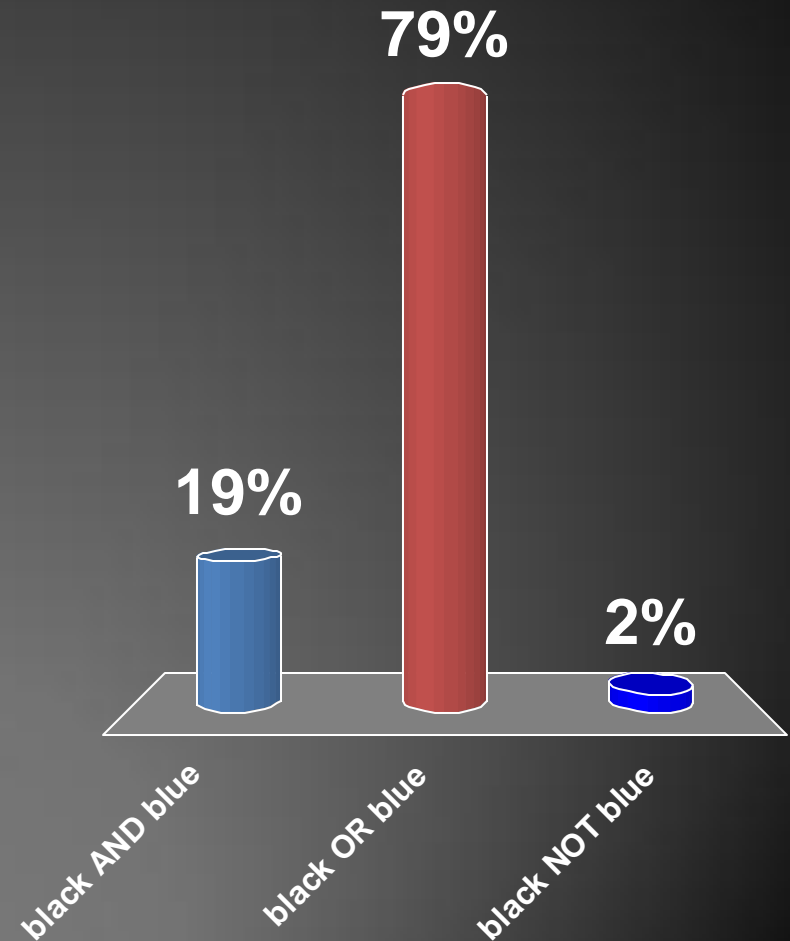
Nursing Methods 403 Autumn 2007 Post-Test

When searching electronic databases, which search phrase will result in the most results?

1. black AND blue

2. black OR blue

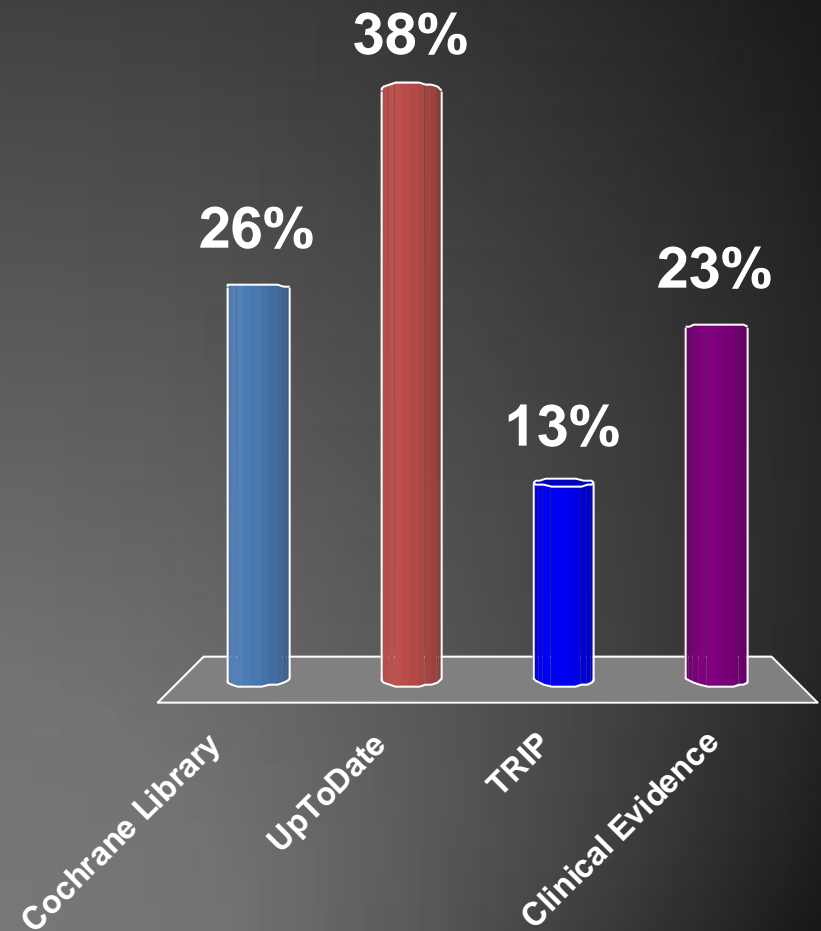
3. black NOT blue



Nursing Methods 403 Autumn 2007 Pre-Test

The best resource to find evidence through systematic reviews is:

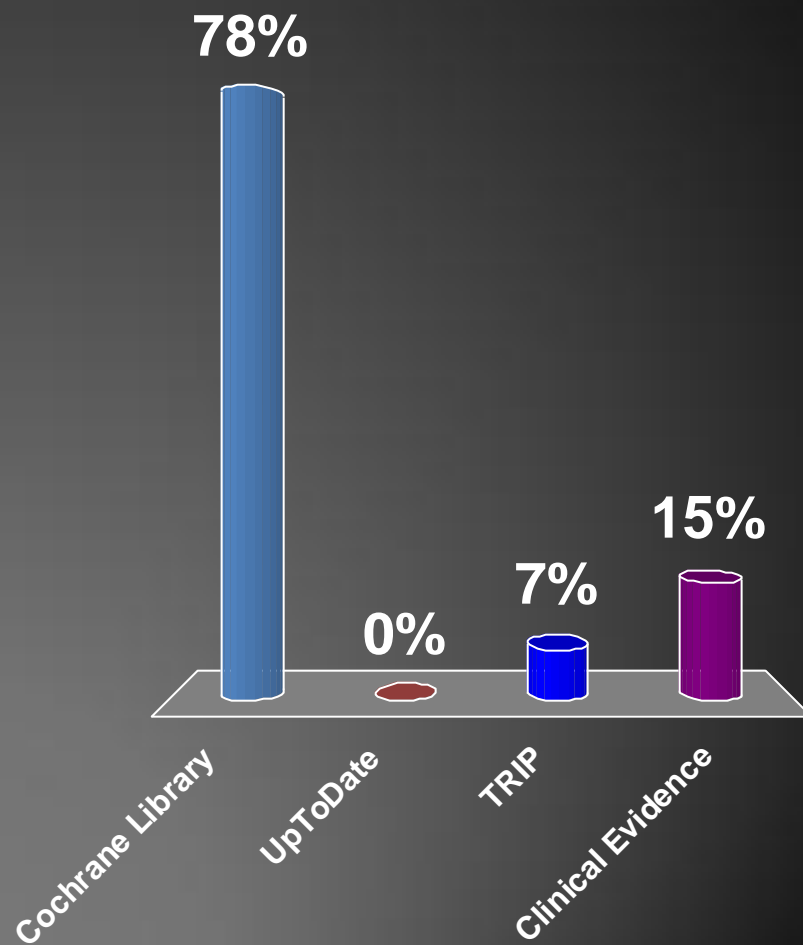
1. Cochrane Library
2. UpToDate
3. TRIP
4. Clinical Evidence



Nursing Methods 403 Autumn 2007 PostTest

The best resource to find evidence through systematic reviews is:

1. Cochrane Library
2. UpToDate
3. TRIP
4. Clinical Evidence



#5: Assess Students' Perception of Session

- Provide a quick way to validate their own learning
- Help identify areas that need improvement
- Students can demonstrate the skills they learned in class

Poll

Types of Questions

- Factual
- Conceptual understanding
- Opinion, beliefs
- Data gathering
- Predictions
- Feedback



*Adapted from: Bruff, Derek. Classroom response systems (clickers).
www.vanderbilt.edu/cft/resources/teaching_resources/technology/crs.htm*

Designing Clicker Questions

- Relate class learning objectives
- Have a purpose:
 - Assessment of previous knowledge
 - Assessment of comprehension
 - Student evaluation
- Frame at appropriate level
- Lend itself for question format
- Easy to read; keep answer options to maximum of 5
- Challenging and stimulating
- Differentiate between lecture slides and polling slides (i.e., color, sound)

Integrating Clickers Into Teaching

- Active Learning : Research indicates question every 15 to 20 minutes
- Questions on the fly: be prepared for contingency teaching
- Avoid overuse: 3-4 questions per 50 minutes good guideline
- Allow 3-5 minutes for each question

Adapted from: Blakeslee, Sarah. It's just a click away. Library Assessment Conference, Seattle, WA. August 2008

Wow features

- *Response Grid*: To find out who has yet to respond to a question, press F7 or F8 shows a "Response Grid" on screen with ResponseCard keypad numbers
- *Comparison Slide*: Track changes in understanding or opinions by asking the same question at the beginning and end of your presentation. See side-by-side results using a Comparison Slide.
- Interactive with *SMART whiteboard*. You can just pick up your pens and start annotating over your slides.

Drawbacks

- **Time away from instruction:** distribute clickers, teach use
- Some instructors feel that clickers are **distracting**, just another slick gadget
- **\$:** Cost of system, and also costs more to use clickers for library instruction sessions than for longer courses

Edutainment



- “New technology is entertaining but can quickly become the focus of a session if not used as part of an appropriate learning activity”
- “We discovered it was important to carefully monitor the amount of time being devoted to clicker questions and evaluate if their use enhanced the instruction

Julian, Suzanne, and Benson, Kimball. Clicking your way to library instruction assessment: Using a Personal Response System at Brigham Young University. College and Research Libraries News 2008; 69(5): 258-61.

Challenges

- Developing appropriate, thoughtful **questions** that allow students to apply their recently acquired knowledge
- Increasing instructor **flexibility** in teaching style
- Gaining **familiarity** with the software and equipment
- Creating and updating **documentation** to promote ease of use and consistency of practice

Tips and Tricks

- Test equipment beforehand.
- Provide clear instructions for use and explain why using them and what can be gained from experience.
- Monitor responses; give warning before ending polling and going to the answer display
- Plan time to discuss responses. Questions are most effective if part of learning experience.

Audience Response System vendors

- TurningPoint turningtechnologies.com
 - 65% education
- iClicker iclicker.com
 - Developed by U Illinois physicists
- Senteo www2.smarttech.com/st/en-US/Products/Senteo/
 - from SMART Technologies
- eInstruction einstruction.com
 - 70% education

Alternative Web Polling Tools

- DyKnow Vision (licensed software; one time cost)
- SurveyMonkey (subscription web survey tool)
- WordPress Polls (add-on to WordPress blog software)

Griffis, Patrick. Assessment Tool or Edutainment Toy. Library Assessment Conference, Seattle, WA. August 6, 2008

What is new with clicker technology?

- Newer models support alpha-numeric answers
 - 10-15 character text entry
 - LCD display screen
 - What about short answer/essay questions?
- Some brands of clickers allow students to register their confidence level (high, medium, or low) along with their answer, providing more detailed feedback to the instructor.
- Use of cell phones to transmit clicker responses

TestingPoint

www.turningtechnologies.com/k12studentresponsesystem/testingpoint.cfm

- Applications are being developed to enhance the assessment capabilities of clickers.
- Instructors can create and administer self-paced assignments, quizzes and tests easily, allowing for real-time summative and formative assessment.
- TestingPoint supports questions in multiple formats:
 - Multiple choice
 - Multiple response
 - Numeric response
 - Matching
 - Fill in the blank
 - True/False
 - Short answer and essay

ResponseWare™ Web

- A revolutionary new response system for mobile devices and more. Uses cell phones and laptops to participate in interactive polling.
- Allows participants to respond via the internet through any web browser
- Immediately transfers their selection to the student response software: TurningPoint

And More from Turning Technologies

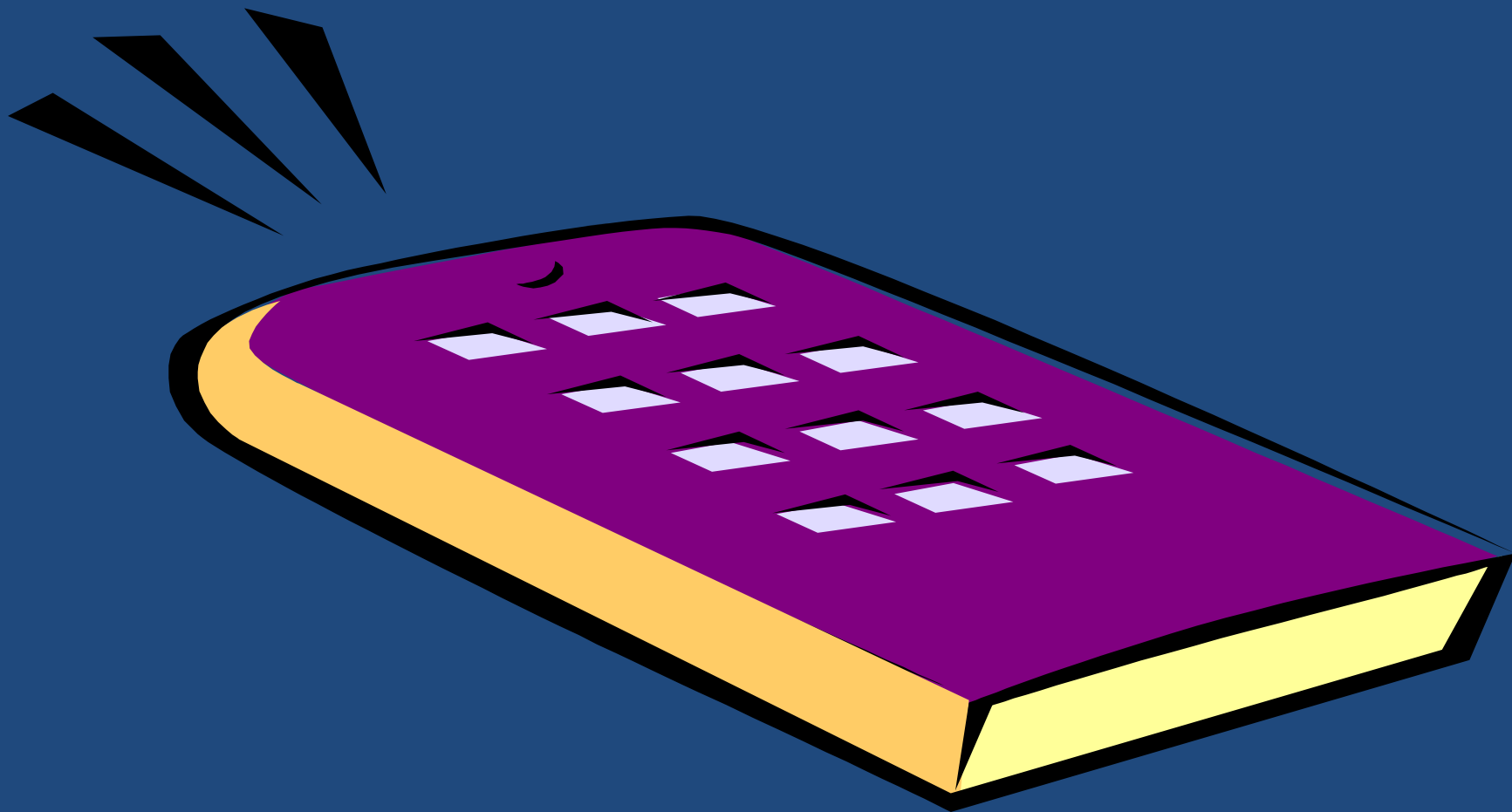
- **Remote Poll** allows for polling students from remote locations and satellite campuses - ideal for video conferencing or satellite broadcasts.
- **Turning Point AnyWhere Software** — poll from any PC application!

Final thoughts on clickers

- Can increase student interactivity and engagement in bibliographic instruction
- Quick assessment tool:
 - Can help instructor assess what students already know coming into the session and allows instruction to be tailored to what students do not know
 - Can assess student knowledge in real-time in class and modify lesson plan (contingent teaching)
 - Can help instructor assess what students have retained/learned in a session as well as areas that need reinforcement
- Get truthful answers
- Work on developing questions; must be based on learning objectives
- Integrate into teaching; not an add-on

Partially adapted from : Griffis, Patrick. Assessment Tool or Edutainment Toy. Library Assessment conference, Seattle, WA. August 6, 2008

Questions?





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PowerPoint available:

healthlinks.washington.edu/hsl/liaisons/schnall/clickaug2008.ppt