



Effective Teacher Series:

Audience Response Systems (ARS)

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20 January 2009

Please select a Team.

My last name begins with:

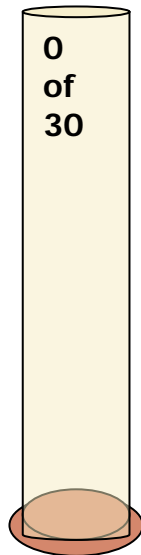
1. A-E

2. F-J

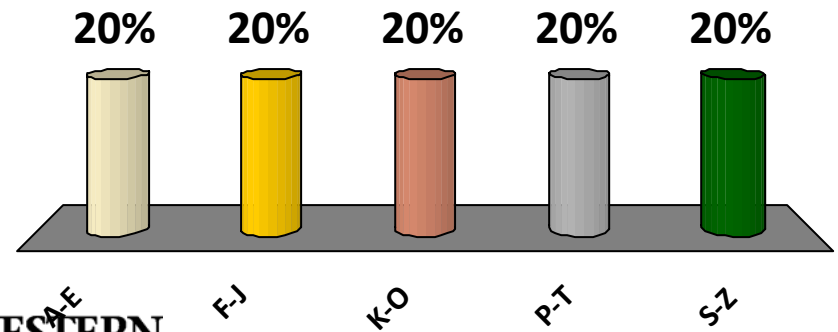
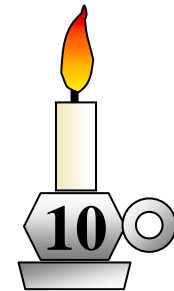
3. K-O

4. P-T

5. S-Z

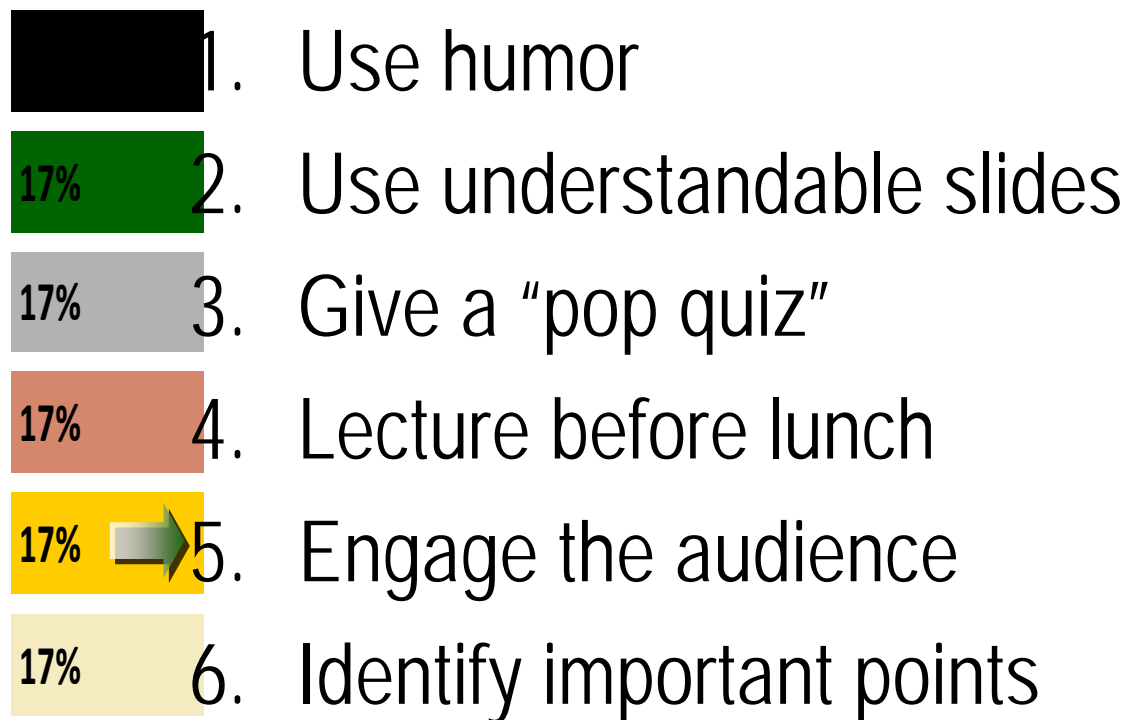


Answer Now



Question 1

Which of the following is the most powerful way to improve overall medical school lecture quality, according to lecture attendees?



Effective Medical Lecture

- ✦ Identify key points
 - ✦ Engage the audience*
 - ✦ Lecture clearly*
 - ✦ Create comprehensible slides
 - ✦ Use a case-based format*
- *strongest predictors of overall lecture quality

"Engaging" Defined

- ✚ Identifies key points
- ✚ Is relevant to audience
- ✚ Is clear
- ✚ Slides are understandable
- ✚ Slides use clear format
- ✚ Case-based approach
- ✚ Board-type MCQ
- ✚ Uses ARS during lecture



Agenda

- ✦ Definitions
- ✦ History
- ✦ Evidence of Efficacy
- ✦ Options for Use in Education
- ✦ Opportunities at UT Southwestern

Team Scores

My last name begins with:

0 A-E

0 F-J

0 K-O

0 P-T

0 S-Z

Definitions: Type of ARS

- ✦ Hard wired – voting modules built into desktops, connected via wiring to system; lower cost, best for fixed venues
- ✦ Wireless – hand held voting modules, portable, higher cost
 - Infrared – requires line of site, much interference
 - Radiofrequency – more reliable relay of signal
 - Internet-based – allows use of PDAs and Smart Phones

How Keypad System Works



3. The computer tallies the responses from the receiver and instantly projects them onto the computer or other projection devices for the presenter or entire group to see. Data can be displayed in a number of ways, depending on your choice of software.

2. When a participant has entered a response on the keypad, it is transmitted to the receiver unit via radio frequency. The receiver then transfers the signal to a computer.



1. Participants use personal wireless keypads to respond to questions.

Questions that ARS Answers

1. Have the students read the text before class?
2. Are the students paying attention?
3. Do the students remember important facts?
4. Are the students thinking?
5. Do the students recognize concepts?
6. Can the student work in a group?
7. Can the students do numerical exercises?
8. What do the students say about the pace and the interest of the lecture?

Benefits of ARS

- ✦ Infuses interactivity into a standard lecture
- ✦ Increases student participation
- ✦ Increases student attendance at lecture
- ✦ Increases student learning
- ✦ Faculty perceived more favorably by students
- ✦ Immediate feedback to students and instructor improves teaching and learning
- ✦ Capability to perform anonymous peer assessment
- ✦ Ability to ascertain student attitudes and opinions
- ✦ Facilitates in-person self-assessment modules for maintenance of certification

Limitations of ARS

- ✘ Commercially available systems are generally bulky and not easily transported
- ✘ Expense of rental or purchase varies greatly with purchase choice
- ✘ Effectiveness depends on instructor competence and equipment reliability
- ✘ Questioning reduces time for lecture content
- ✘ Faculty time to develop questions and prepare for discussion of question options
- ✘ Some students have negative perception of audience response systems as “playing games”

History

✦ 1960s

- Movie Industry: "Audience Studies Institute"
- Business: "The Consensor"

History of ARS in Education

- ✚ **1985:** Halloun and Hestenes demonstrate lecture-based physics courses do not teach well the conceptual understanding of Newtonian mechanics in introductory physics courses.
- ✚ **1999:** Hake demonstrates interactive engagement (IE) increases knowledge gain in physics courses using same instruments as Halloun and Hestenes.
- ✚ **2004:** Effectiveness of ARS with medical audiences is demonstrated.

Question 2

Which of the following is the most powerful reason to use ARS that is supported by the literature?

20%

1. Audiences like it

20%

2. It improves lecture evals

20%

3. It improves test scores

20%

4. It makes better doctors

20%

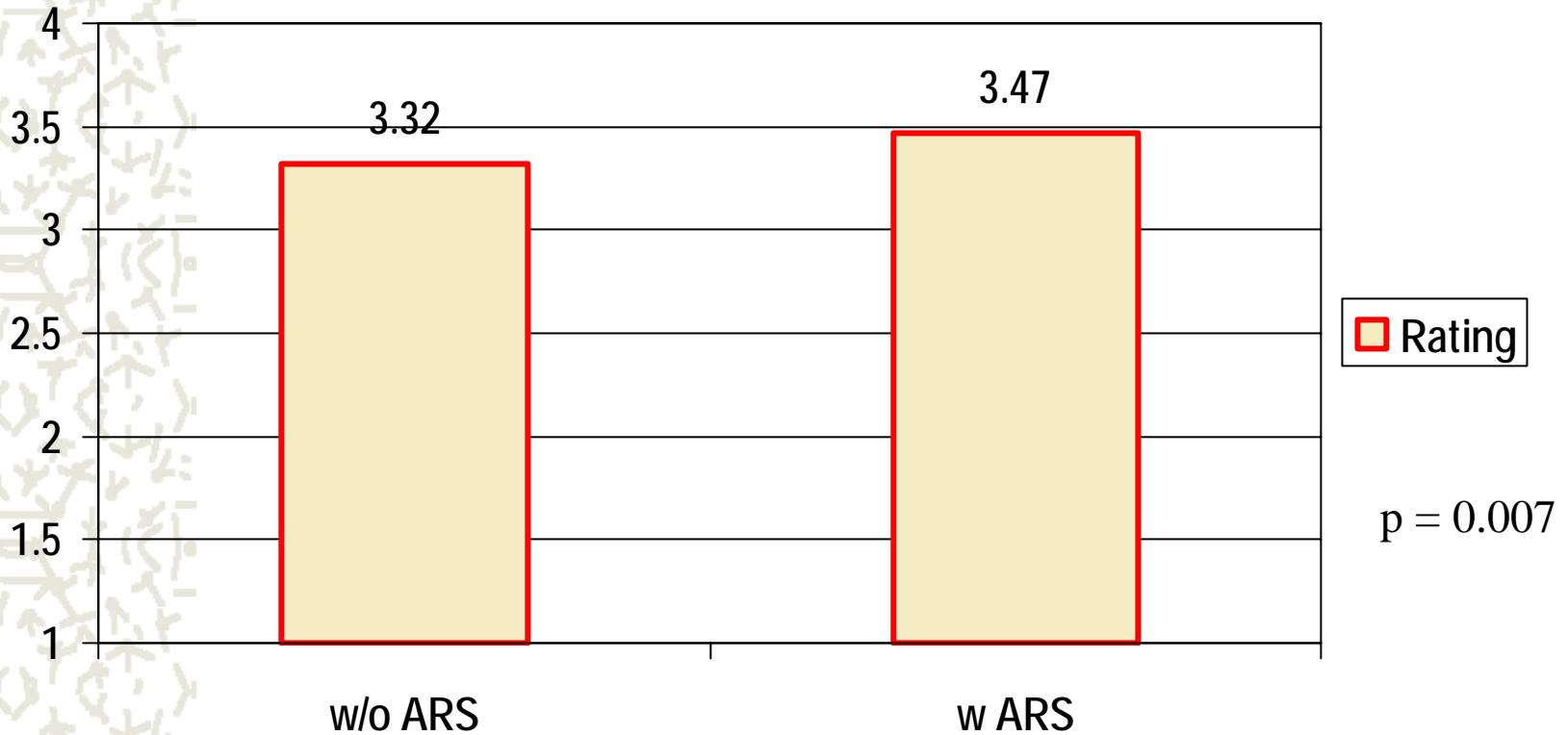
5. It ends world hunger

Audience Response to ARS

Statement: ARS ...	% Agree
Was well liked	90.5%
Facilitated learning	92.4%
Helped teach reasoning	90.1%
Helped teach facts	89.3%
Was good for board-type MCQ	92.3%
Maintained alertness/interest	90.8%
Helped ID learner weaknesses	85.1%
Anonymous nature helpful	79.7%

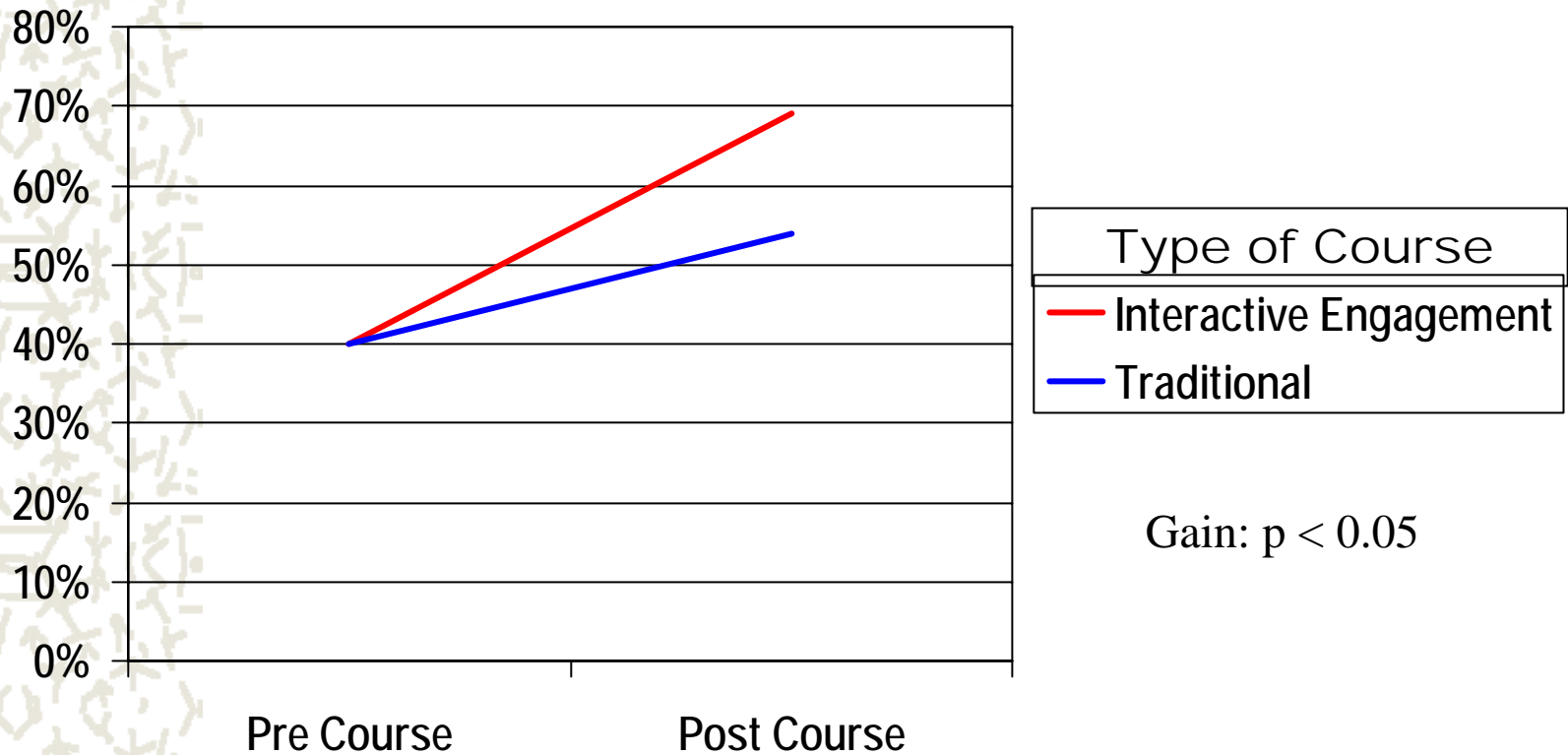
Lecture Evaluations and ARS

Score on Evaluation of Lecture
(1=poor, 2=fair, 3=good, 4=excellent)



Learning and ARS

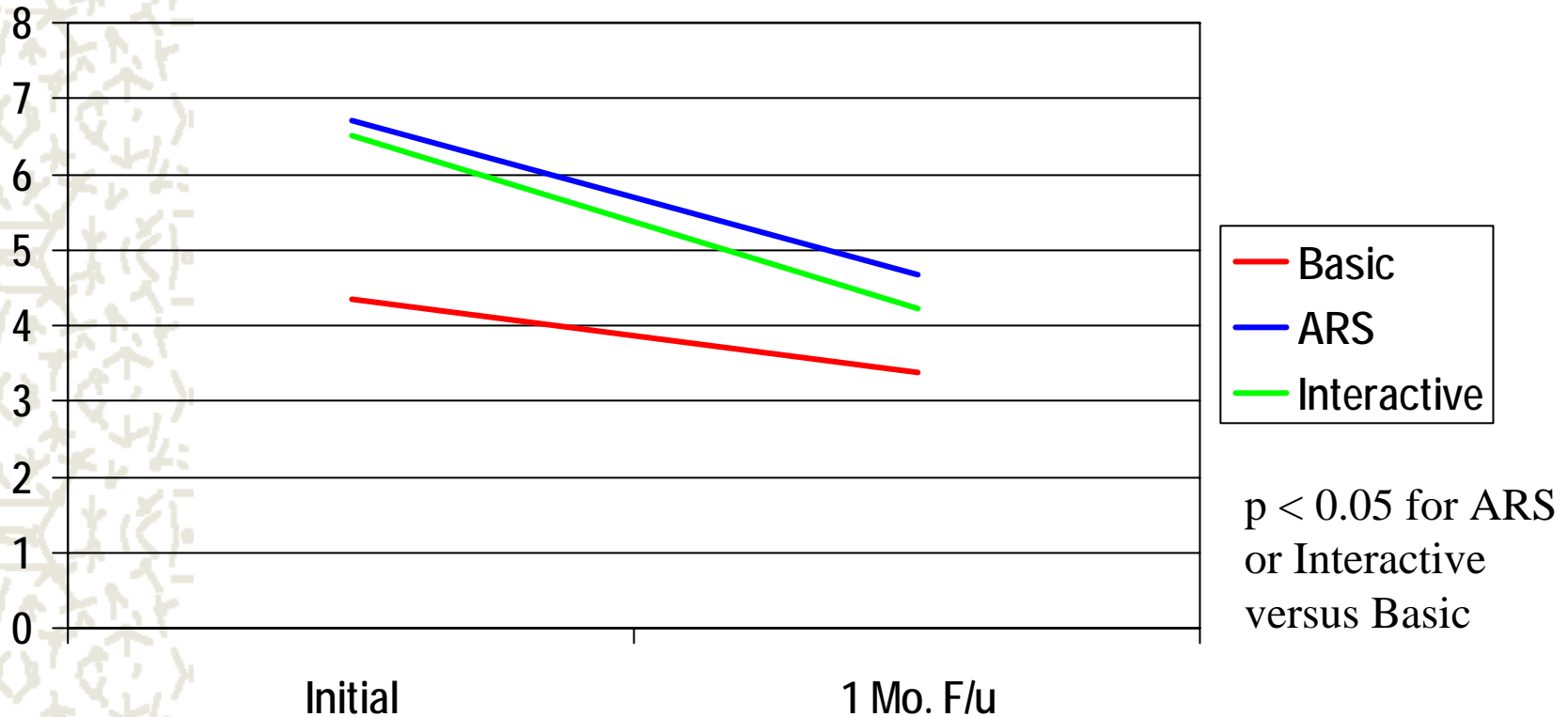
Score on knowledge test



Gain: $p < 0.05$

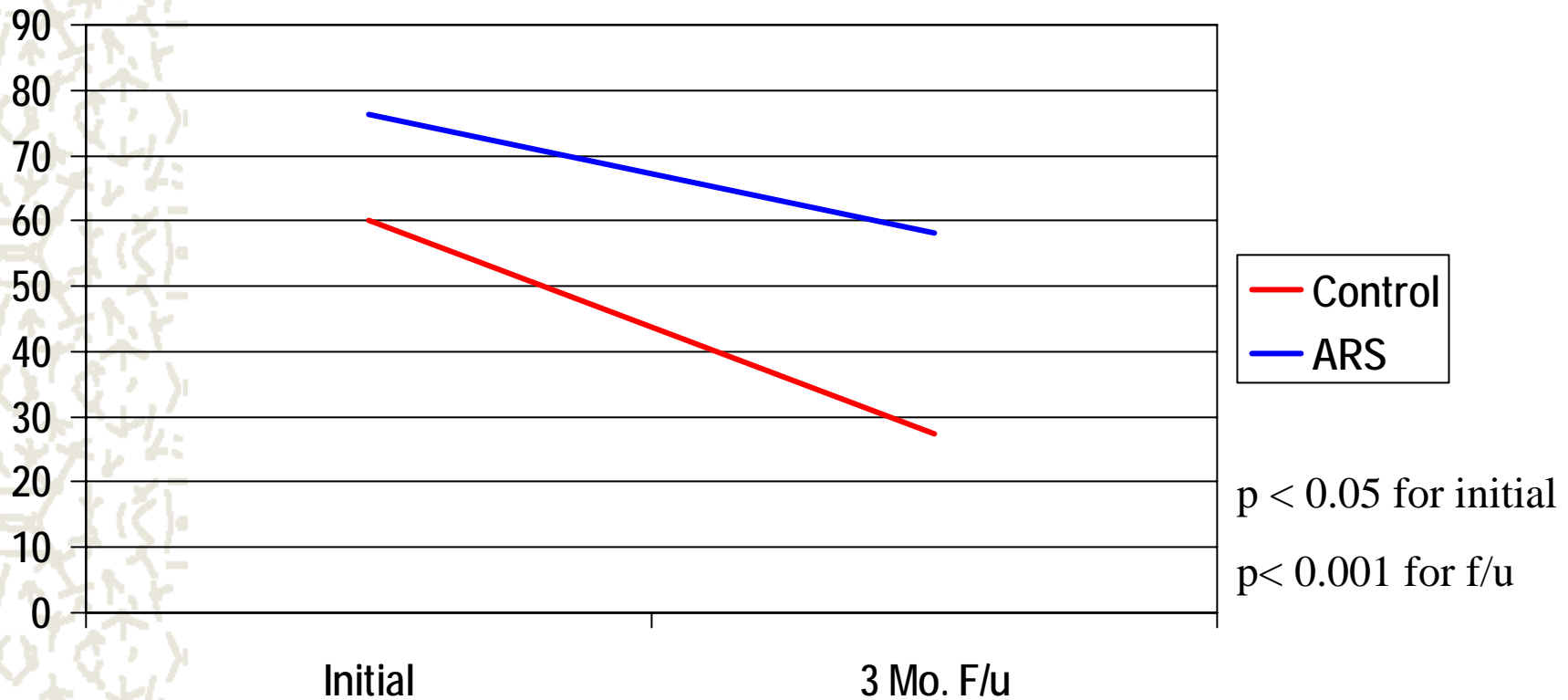
Family Medicine Residents and ARS

Score on knowledge test



Radiology Residents and ARS

Score on knowledge test



Team Scores

My last name begins with:

0 Team 1

0 Team 2

0 Team 3

0 Team 4

0 Team 5

0 Team 6

Opportunities at UT Southwestern

✚ ARS

- RF system on computer separate from presentation
 - Must involve AV technicians
 - Must toggle between presentation and RF system

✚ TurningPoint

- RF system integrated into presentation (PowerPoint)
- No involvement of AV technicians

ARS and UT Southwestern

✚ Cost

- Curriculum events: no charge at present
- Non-curriculum events: \$900.00 per half day.

✚ Availability:

- D1 lecture halls on campus
- Regular office hours (M-F 8am-5pm)

✚ To arrange:

- UT Southwestern faculty must be requestor
- Larry Sturgill 83695
- Chris Cordell 83695
- 5 days advance courtesy notice for usage.

- Requires a technician to set up ARS software before and hardware during event

ARS and UT Southwestern

- ✚ 150 Wireless keypads (\$179/each)
 - (225 additional keypads used by CME)
- ✚ Software, licenses, shipping carrying cases.
- ✚ Total of: \$25,830



TurningPoint at UT Southwestern

✦ Medical School:

- MS1s and MS2s are each issued a Response Card
- Audiovisual Services have Receivers
- May not be used for grading or attendance

✦ 40 Response Cards and 8 Receivers may be checked out by UT Southwestern community at Student Center



Known Issues with TurningPoint

- ✖ More glitches with Mac
- ✖ Incompatible with Streaming Video

The Future of ARS

- ✚ Internet enabled ARS
- ✚ ClassInHand – Instructor Mobile ARS
- ✚ Web-based homework
- ✚ Web-based Simulations/Games

In Conclusion

- ✦ “This approach combines many of the key components important for adult learners: interactivity; commitment to an answer from the learner; timely feedback, and the highlighting of key concepts with ‘take home points’ by the faculty expert. All of this is accomplished in a non-threatening environment provided by the relative anonymity of the audience response system.”

Where does UTSW community go to check out TurningPoint equipment?

20% 1. Library

20% → 2. Student Center

20% 3. Medical Television

20% 4. Audio Visual Services

20% 5. Information Resources

Where does the UTSW community go to check out ARS equipment?

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20% 2. Student Center

20% 3. Medical Television

20% → 4. Audio Visual Services

20% 5. Information Resources



Team Scores

0	Team 1
0	Team 2
0	Team 3
0	Team 4
0	Team 5
0	Team 6



Thank you