



Effective Teacher Series:

Audience Response Systems (ARS)

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Trial Question

Which of the following selections best describes your lunch?

- A. Salmon
- B. Salad
- C. Sandwich
- D. Skipped
- E. Steak
- F. Sushi
- G. Shake
- H. Somethin' else

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.



Objectives

After the lecture, the participant will be able to

1. List the 5 attributes of the effective medical lecture
2. List the 3 types of ARS
3. Cite the 3 evidence-based benefits for using ARS
4. List the uses of an ARS
5. List the 3 general ways ARS can be incorporated into existing, passive lectures
6. List the resources needed for using ARS at UT Southwestern

Question 1

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

- A. Use humor
- B. Be sure slides are complete
- C. Give a "pop quiz"
- D. Lecture before lunch
- E. Engage the audience
- F. Identify important points

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

Question 2

✎ A lecture is given to a medical audience where the lecturer identifies key points, engages the audience, lectures clearly, and uses a case-based format, but the lecturer wants to further improve her evaluations. Which of the following attributes of the lecture should be investigated next?

- A. The day of the lecture
- B. The slides
- C. The time of the lecture
- D. The use of humor
- E. The use of a "pop quiz"

Question 3

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

- A. Audiences like it
- B. It improves lecture evaluations
- C. It improves test scores
- D. It makes better doctors
- E. It ends world hunger

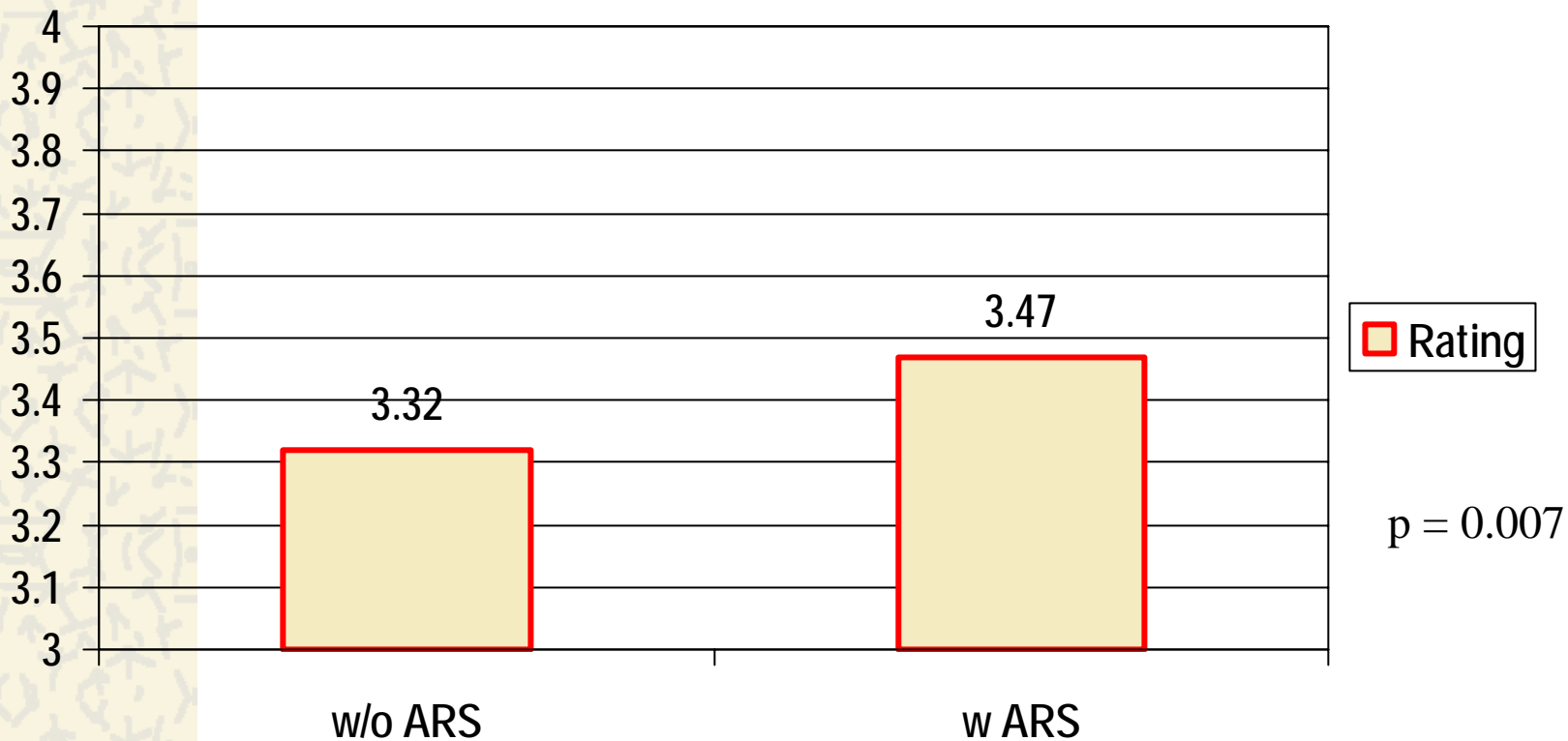
Audience Response to ARS

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

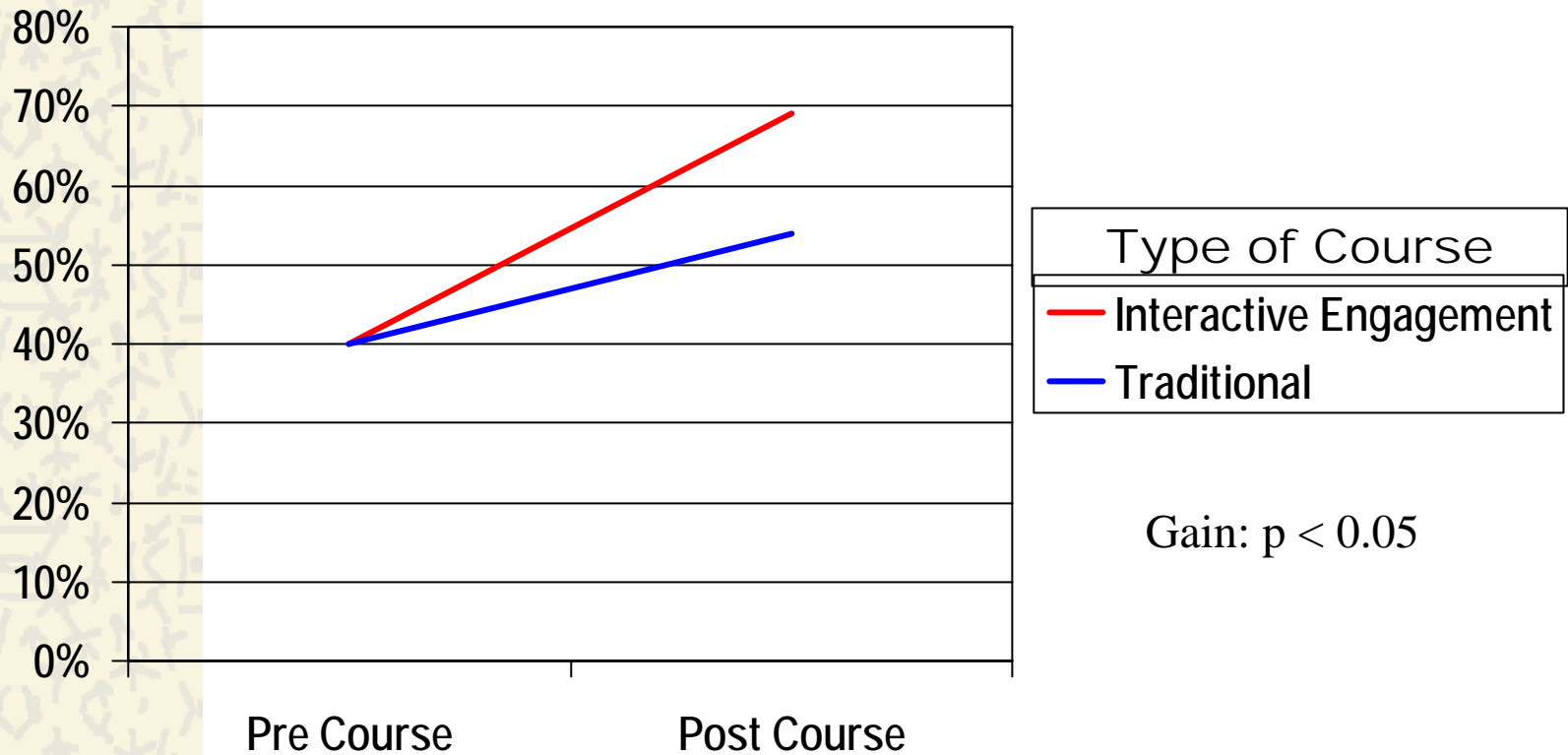
Score on Evaluation of Lecture

(1=poor, 2=fair, 3=good, 4=excellent)



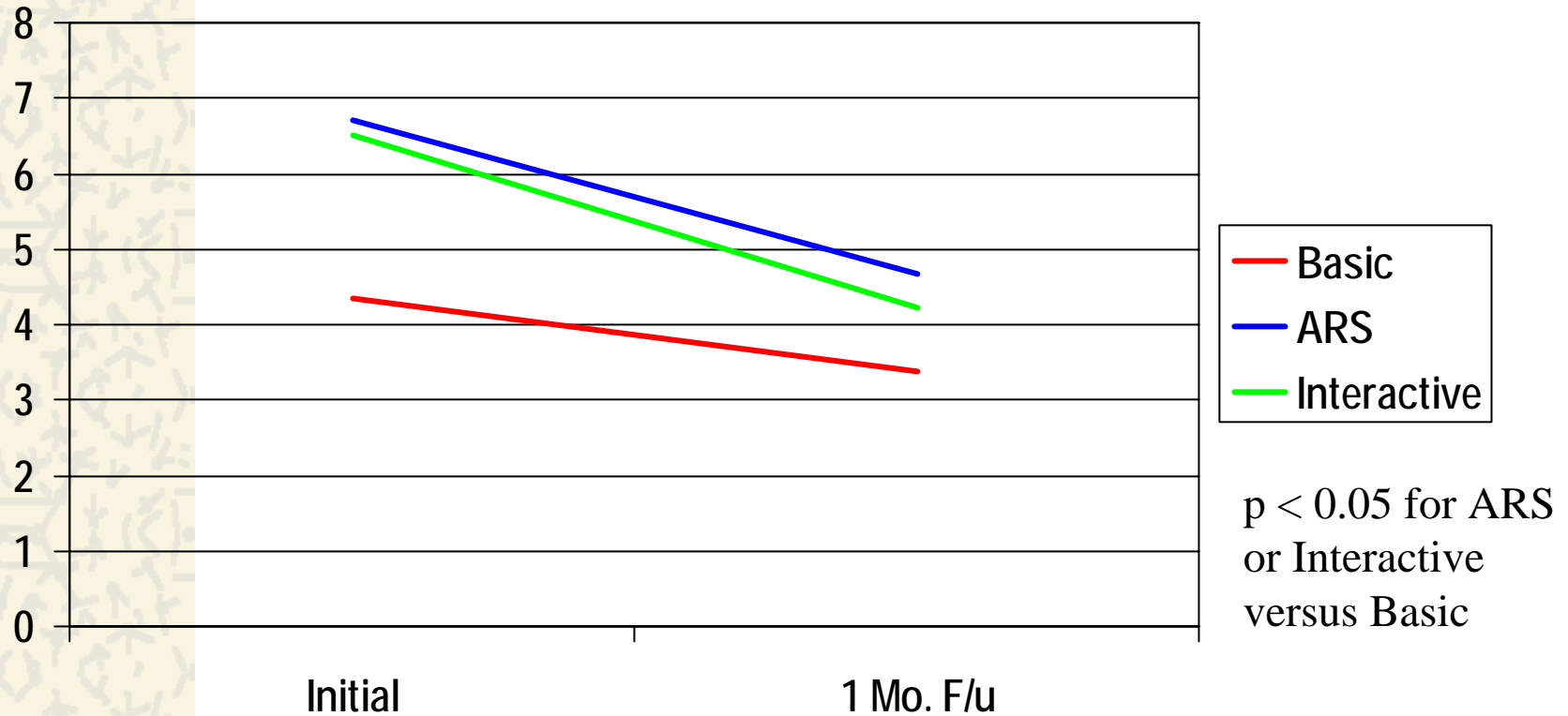
Learning and ARS

Score on knowledge test



Learning and ARS

Score on knowledge test





Question 4

How am I doing so far?

- So far, the lecture is very clear and I have no questions
- I have a question or two
- I have a lot of questions
- I am so confused, I don't have any questions

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

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?

General Uses of ARS

- ✦ Introduction of new topic via MCQ (pretest)
 - Emphasizes relevance of topic
 - Defines learning needs of student
- ✦ Assessment of student understanding of presented topic (posttest)
 - Defines learning needs of student
- ✦ Assessment of lecturer performance (evaluation)
 - Allows lecturer to respond to student needs

Question 5

Which of the following is required to incorporate ARS into a curriculum-related lecture on campus?

- A. A phone call & a list of questions
- B. The above and a request from a department chair
- C. The above and an IDR for \$50/hour
- D. An IDR for \$500/hour
- E. All of the above
- F. None of the above, just forget about using ARS

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
- ✚ Coming: Plug-in for PowerPoint?

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.”



Thank you