To Click or Not to Click; No Longer a Question

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Chief Residents
Denise Bratcher, Keith Mann, Amber Hoffman
Program Directors
Conflict of Interest

- We have no financial disclosures or conflicts of interest related to this presentation.

- Our institution owns the Audience Response System designed by Turning Technologies, Inc.
Objectives

- Identify the key components of an audience response system (ARS)
- Understand the challenges inherent in the traditional one-hour conference format
- Recognize multiple ways an ARS can enhance conference
- Understand how to use the technology effectively
- Identify at least one non-teaching use of an ARS
- Apply learned skills through guided and hands-on instruction
Audience Response Systems

- A tool that facilitates interaction between teacher and audience
- Simultaneously collects and analyzes data
- Approximately 15 vendors
- Wide range of costs, functions, strengths and weaknesses
Audience Response Systems

- Three Key Components
  - Software
    - Integration with Microsoft Powerpoint
  - Receiver
    - Infrared and Radiofrequency
  - Response Device
    - Vary widely
Please select a Team.

1. Chief Resident
2. Asst. Program Director
3. Program Director
4. Coordinators
My clicker shows a green light when I press a button.

1. True
2. False
3. Unsure
My clicker is working correctly.

1. Yes
2. No
3. Unsure
My institution has an ARS.

1. Yes
   0%

2. No
   0%
I’ve given an ARS based lecture before.

1. Yes
2. No
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Traditional One Hour Conferences

What barriers do Teachers/Educators face when preparing and delivering a traditional one hour lecture?

What barriers to Residents/Learners face when attending a traditional one hour lecture?
The Educational Landscape

- Resident physicians are adult learners with multiple competing demands on their time.

- Physician teachers are often challenged to cover large amounts of information dense material in a short period of time.
The Educational Landscape

- Despite advances in medical knowledge the process for delivering medical information to physicians in training remains largely unchanged.

- Most didactic sessions rely heavily on the traditional lecture format.
The Traditional Lecture Format

- The flow of information is passive, one-way
  - Conceptual misunderstandings
  - Engages only a few

- Typically occur over a one hour period
  - Sustained attention is known to be challenging for adult learners

The _____ of a lecture is the most easily recalled.

1. beginning
2. middle
3. end
The Traditional Lecture Format

- Medical school material is “dense”
  - 24 facts and concepts per hour in first two years of medical school
  - Compares to 10 facts/concepts per hour for Math and Fine Arts majors

- Knowledge retention worsens with increased information density
  - High density vs Low density lectures
  - Pretest scores demonstrated equal knowledge
  - Post-test scores of 70% vs 82% (p<0.001)

The Traditional Lecture Format

- There is a lack of correlation between conference attendance and long-term knowledge retention
  - 21 Family Practice Residents
  - 87 noontime conferences
  - Short term test scores of attendees were 12 points better than non-attendees (P=.001)
  - Long term test scores showed no difference between the two groups

The following is the “hurdle” I perceive as most challenging in using the one-hour conference to teach Residents:

1. Resident fatigue/distraction
2. Teacher “time crunch”
3. One-way flow of information
4. Short attention spans
5. Information dense material
6. Poor long term knowledge retention
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## Using an ARS in Med Ed

<table>
<thead>
<tr>
<th>Use</th>
<th>Benefits to Learner</th>
<th>Drawbacks</th>
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600
The Impact of Using ARS

- Increases Attendance
  - Pediatric department at Mayo struggled with conference attendance at board review lectures
  - After institution of ARS format, attendance increased by 50%
  - This increase was sustained over the reported 2 year period

The Impact of Using ARS

- Increases learner engagement by allowing all students to answer all questions
- Gives instructors the ability to emphasize and test understanding of important concepts
- Periodic clicker breaks help relieve student fatigue and restart the attention clock

The Impact of Using ARS

- Increases knowledge retention amongst those with similar base knowledge
  - Prospective, randomized controlled trial of 17 OB/Gyn residents lectured on oral contraception
  - Both groups given pretests which demonstrated similar knowledge base (80% vs 78%)
  - Groups given same posttest 6 weeks later
  - Traditional lecture scores improved by 2%
  - ARS lecture scores improved by 21% (p=.018)

The Impact of Using ARS

- **Positive Learner Attitude**
  - 82% of residents surveyed in Pradhan paper thought that the ARS was a helpful learning aid.
  - The majority of the residents surveyed in the Homme article thought ARS lectures were “very educational, valuable and fun.”


The Impact of Using ARS

Data from CMH

Comparison of Percent “Excellent” Ratings

<table>
<thead>
<tr>
<th>Group</th>
<th>Excellent</th>
<th>SD</th>
<th>N</th>
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<tr>
<td>Clicker</td>
<td>87%</td>
<td>0.11009</td>
<td>18</td>
</tr>
<tr>
<td>Traditional</td>
<td>60%</td>
<td>0.2392</td>
<td>62</td>
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Residents view ARS based lectures as higher quality than traditional lectures.

The two-tailed P value <0.0001. t=4.5571
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Initial Needs Assessment

- **Goal**
  - Get to know your audience’s knowledge base and learning needs

- **To do**
  - Ask the audience a series of questions at the start of your lecture
  - Skim through areas of the lecture that the majority understand
  - Spend more time in areas where answers varied widely
Are mist tents an effective treatment for croup?

1. Yes
2. No
3. Unsure
Discuss Mist Tents in Croup

- The majority of the audience chose an incorrect answer
- This indicates a need to discuss the topic further
- Conditional branching rules will advance presentation to this slide
- This slide set reviews the literature on the use of mist tents in management of croup
Skip Discussion on Mist Tents

- The majority of the audience chose the correct answer
- This indicates that your audience understands the take home point on this topic
- Conditional branching rules will advance presentation to this slide
- This allows you to skip the material involving mist tents and move on to steroid choices in croup
You use your cell phone to..

1. What cell phone?
2. Text and call
3. Do everything!
Assessment of Audience Preference

- **Goal**
  - To spend time on areas that the audience is interested in ultimately increasing learner engagement

- **To do**
  - Prepare more material than you can cover in an hour
  - Allow learners to identify concepts or cases they’d like to learn or reinforce
In regards to ARS I would classify myself as:

1. a novice
2. an intermediate user
3. an advanced user
In regards to ARS I would classify myself as:

- A novice: 33%
- An intermediate: 33%
- An advanced: 33%

What cell phone? Text and call. Do everything!
Question Driven Instruction

▪ Goal
  ▪ To teach by using a question and answer format
  ▪ Is the simplest format to use for new ARS users

▪ To do
  ▪ Board review and class competitions are great places to use question format
<table>
<thead>
<tr>
<th>A Picture is Worth 100 Points</th>
<th>Growing Like a Weed</th>
<th>An Ounce of Prevention</th>
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<tbody>
<tr>
<td>100</td>
<td>100</td>
<td>100</td>
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<tr>
<td>200</td>
<td>200</td>
<td>200</td>
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</table>
During the health supervision visit of an infant, you place her prone on the examination table. She is able to track your penlight, following it 180 degrees by lifting her head and shoulders off the table.

Of the following, these developmental milestones are MOST typical for an infant who is…
Of the following, these milestones are most typical for an infant who is:

1. 1 month
2. 2 months
3. 4 months
4. 6 months
During the prenatal visit with new parents, a mother expresses concern about regulating the temperature of the bath water for the new baby.

Of the following, the temperature that has been determined to be appropriate for hot water heaters is CLOSEST to...
The temperature that has been determined to be appropriate for hot water heaters is CLOSEST to...

1. 110 F
2. 120 F
3. 130 F
4. 140 F

Question Board
- A couple comes to you for counseling following the delivery of a stillborn fetus that had multiple anomalies 1 year ago. They would like to have another baby, but they are concerned about the possibility of recurrence.
- The couple declined autopsy after the fetus was delivered, but they bring you photos for review.
Of the following, the MOST accurate statement regarding this condition is that it stems from an abnormality that usually occurs:

1. At conception
2. In the first trimester **(Correct)**
3. In association with amniocentesis
4. In association with chorionic villus sampling
5. In the third trimester
<table>
<thead>
<tr>
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<th>Team Scores</th>
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<tr>
<td>900</td>
<td>Chief Resident</td>
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<td>900</td>
<td>Asst. Program Director</td>
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<td>900</td>
<td>Program Director</td>
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<td>750</td>
<td>Coordinators</td>
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<td>Score</td>
<td>Participant</td>
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<tr>
<td>900</td>
<td>Participant 2418FF</td>
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<tr>
<td>900</td>
<td>Lindsey Albenberg</td>
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<td>900</td>
<td>Amber Hoffman</td>
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<td>900</td>
<td>Sarah McCormick</td>
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<td>800</td>
<td>Participant 12C1A0</td>
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<td>700</td>
<td>Ross Newman</td>
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</tbody>
</table>
Evaluation of Concept Comprehension

- **Goal**
  - To test in real time the audience’s understanding of key concepts presented

- **To do**
  - Utilize cases or questions to assess the audience’s ability to apply lecture material to a specific situation
The Average Adult Attention Span is approximately:

1. 1 minute
2. 5 minutes
3. 10 minutes
4. 15 minutes
5. 45 minutes
Critical Thinking Skills

- **Goal**
  - To encourage use and further development of critical thinking skills

- **To do**
  - Present cases or questions to which there is more than one correct answer or approach to management
  - Poll audience, allow discussion, repoll
Critical Thinking

In this cycle, we start with **Inform + Describe**:
- Begin to clarify what you need to know, what you already ‘know’, and what information you have about your issue/topic.

Next, we move to **Discover + Explore**:
- Look at your issue/topic more closely; start to be more directed and purposeful in seeking information.

Then, we proceed to **Integrate + Apply**:
- Bring together the various ideas that you have considered in order to consolidate and articulate new understanding(s).

Following this, we have **Test + Revise**:
- Weigh up the evidence, test out different ideas and alternatives.

Finally, we arrive at **Negotiate + Cooperate**:
- Consider different perspectives; engage in discussion with others.
The Peer Learning Model

- A 4 day old presents in July with fever to 103F and lethargy
- Mom had fever during labor and cramping abdominal pain
- GBS positive, received appropriate IAP
- All prenatal infection screens negative
- Initial evaluation revealed a tachycardic, tachypneic, febrile, lethargic infant with delayed capillary refill
- CBC normal, Transaminases elevated, PT elevated
Of the following diagnoses, please select the three that you believe are most likely.

1. GBS Sepsis
2. Disseminated HSV
3. Neonatal Hepatitis
4. Neonatal Enteroviral Syndrome
5. Hypoplastic Left Heart
Of the following diagnoses, please select the three that you believe are most likely.

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Applicant Awesome

1. Unacceptable 0%
2. Barely acceptable, major concerns 0%
3. Concerns that need further discussion 0%
4. Acceptable, minor concerns 0%
5. Solid candidate, will be satisfactory 0%
6. Solid candidate with obvious potential 0%
7. Desirable candidate, will do well 0%
8. Highly desirable, will do well above average 0%
9. Highly desirable, leadership potential 0%
10. Superstar, will be one of the best residents (Future Chief) 0%

Mean =
Variance =
Applicant Red Flag

1. Unacceptable
2. Barely acceptable, major concerns
3. Concerns that need further discussion
4. Acceptable, minor concerns
5. Solid candidate, will be satisfactory
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7. Desirable candidate, will do well
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Mean =  
StdDev =
Other ARS Applications

- M&M Conference
- CME for Faculty
- Ethics conferences
Report Demonstration
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5 Minute Break

Then return to your groups for Guided Instruction
I learned something of value from this workshop.

1. Strongly Agree
2. Agree
3. Neutral
4. Disagree
5. Strongly Disagree
I will apply at least one concept I learned here in my teaching.

1. Strongly Agree
2. Agree
3. Neutral
4. Disagree
5. Strongly Disagree
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Thank you for attending our Workshop!