Why Use an Audience Response System?

- Attention-span of average adult learner in a lecture is a maximum of 20 minutes
  - An ARS helps fight the “fade” in attention that occurs during lectures
- Even a great lecture does not produce large gains in learning **
- Improved student attitudes
  - The majority of students like using the ARS


Bloom’s Taxonomy of Cognitive Domains

| Evaluation | Conceptual questions using ARS can “push” students’ understanding to higher levels |
| Synthesis   | Lectures focus on lower levels of understanding |
| Analysis    | |
| Application | |
| Comprehension | |
| Knowledge   | |

Designing Questions For Use With the Audience Response System

- Every question should have a clearly identifiable purpose or goal:
  - Drawing out students’ background knowledge and beliefs on a topic
  - Making students aware of their own and others’ perceptions of a situation
  - Discovering points of confusion or misconception
  - Distinguishing two related concepts
  - Realizing parallels or connections between ideas
  - Elaborating the understanding of a concept
  - Exploring the implications of an idea in a new context

Designing Questions For Use With the Audience Response System (cont)

- Avoid computational or simple factual questions that probe memory rather than understanding
- Ambiguity may be good for an ARS question!
  - Focus on thinking, rather than memorization
  - A broadly spread histogram of student answers may indicate an effective question, unless you are checking for understanding of a topic before moving on to a new concept.
- “Wrap-up” Questions:
  - Use ARS to assess student understanding of material that has just been presented. If gaps in knowledge are evident, the material can be reviewed before moving on.


Other Issues Related to Questions

- Simple questions can be used to check if students have done reading assignments
- A few “easy” questions are OK, but using too many will bore students
- Questions with a variety of responses on the histogram are the most useful
  - Students have a variety of opinions (or misconceptions)
  - A teaching opportunity is at hand!

How Many Questions?

- In general, plan on at least two minutes per question.
- For a 45-50 minute presentation, you should probably use no more than 5 or 6 questions, depending on the type of presentation
  - A Q&A or Review session will use more questions, since that is the principle format of the session
- Space the questions out!
  - Remember, most learners are only going to be able to stay focused for 15-20 minutes at a time, so having a question every 10-15 minutes is useful for keeping your learners engaged.
How I Use Questions with ARS

- Introduction:
  - Demographics
  - Ice Breaker
- During the Presentation:
  - Use a question as a “preview” of the coming topic (to develop interest in the topic, or to gauge knowledge of the audience)
  - Use a question as a “review” of the topic (to gauge knowledge of audience)
  - As the principle format for the presentation:
    - Exam or board review
    - “Q&A” with feedback on the answers as a form of discussing the topic

Video Clips

- What?
  - Student encounters:
    - Feedback
    - Self-reflection
  - Lectures
  - Patient findings
- Upload to computer
  - Podcast
  - PowerPoint
  - Internet (YouTube, etc).
    - Be careful about getting consent/assent

Video Clips from Other Sources

- MedEdPORTAL
- YouTube
- Google Video
- iTunes
- Educational Sites: Example: Medical College of Wisconsin
  - “Award-Winning Clinical Teachers Teach”
  - “Standardized Ambulatory Teaching Situations” (SATS)
- Hollywood – a whole different workshop!
Adding Video

- A bit more complicated than adding images due to the various video formats.
- If you are using PowerPoint on a PC, your video clip needs to be in “Windows Media Video” (.wmv) format.
- Converting files from one format to .wmv is another topic for another day.
- Most common on web: Flash (.flv)
  - YouTube
  - Google Video
- Web sites are available to do this:

Podcasts in Education

- Resources for Teachers
  - Teaching skills
  - Ideas
  - Administrative & Leadership Skills
  - iTunes Store:
- Teaching Resources for Learners
  - Video capture lectures and presentations for later review
  - Short clips that can be used for “just in time” learning

Learning Objects

- Short video clips demonstrating:
  - Procedures
  - Physical Exam techniques
  - Physical Exam findings
  - Diagrams
  - Patient findings
  - Teaching skills
- Can be downloaded to iPod/iPhone
- “Just in time” learning
Learning Objects: YouTube

- Huge Repository of video clips
- Search, then choose “Playlists”
  - Heart sounds
  - Breath sounds
  - Medical procedures
  - Physical exam
  - etc

MedEdPORTAL - Overview

- MedEdPORTAL is a free online peer-reviewed publication service provided by the Association of American Medical Colleges (AAMC) in partnership with the American Dental Education Association (ADEA).
- MedEdPORTAL was designed to promote educational collaboration by facilitating the open exchange of peer-reviewed teaching resources such as tutorials, virtual patients, simulation cases, lab guides, videos, podcasts, assessment tools, etc. While MedEdPORTAL’s primary audiences include health educators and learners around the globe, it is open and available for free to the general public.
- Users can access quality, peer-reviewed teaching material and assessment tools in both the basic and clinical sciences in medicine and in oral health.

MedEdPORTAL – Overview (2)

- With MedEdPORTAL, users can download or access the majority of the published resources directly from the website. Published authors retain their original copyrights and indicate on the MedEdPORTAL website how others may use the materials.
- In addition, all third-party copyrighted materials and patient privacy issues are addressed during the submission process so users can download and utilize any and all of the published resources for educational purposes without legal infringements.
MedEdPORTAL – Bottom Line

- A great resource for instructional materials
- Searchable
- Free
- Peer-reviewed
- A great place to showcase your educational scholarship!
- Meets the new consensus on scholarship from the AAMC and the GEA:
  - Product
  - Publically-disseminated
  - Peer-reviewed

Simpson D, Fincher RE, et al. Medical Education 2007;41:1002-1009

Digital Image File Formats

- JPEG: (Joint Photographic Experts Group) **
  - Lossy Compression
  - Great for Web or computer applications
  - Files can be saved with a variety of quality (the higher the quality, the less the compression, larger the file)
- GIF: Graphic Interchange Format
  - Lossless Compression
  - Used for Web, but only uses 256 colors
  - Can be animated
- PNG: (Portable Networks Graphics) **
  - Like a GIF but better
  - Cannot be animated
  - Supported by most (but not all) web browsers

** My Recommendations for use in PowerPoint

Megapixels: Is More Better?

What Do You Need the Pictures For?

- High resolution  ➔ more memory per picture
- High resolution is most important for printing photographs or making slides
- Computer applications (Internet, PowerPoint) do not require high resolutions:
  - Total pixels on an entire 1024 x 768 (standard) screen: 786,432 pixels (0.79 megapixels)
  - Large pictures take longer to load – big problem for Internet applications
  - Lots of pictures  ➔ presentation will be much bigger
Digital Cameras for Medical Education: Useful Features

- **Size**
  - The easier to carry, the more it will be used
- **Macro capability**
  - Great for rashes, and tables/figures from books
- **Video capability**
  - Can work almost as well as camcorder
- **Zoom:**
  - **Optical zoom** is the key feature. Better optics equals higher price
  - Digital zoom does nothing more than what you could do yourself on the computer

Pictures of Patients

- Very helpful for case conferences, morning report, etc.
- “Virtual Derm Consults”
- You must get consent from parent and assent from patient (if old enough)
  - Verbal if no identifying characteristics, otherwise written consent is required
  - See your institution for appropriate forms (and rules)
- If you use in PowerPoint, remove all patient-identifying information

Legal Issues: Fair Use Doctrine

- You can use pictures from copyrighted written material for educational purposes as long as:
  - You are using it only for educational purposes
  - You do not make money on it (I would interpret this as OK for a CME presentation as long as you did not provide it to participants in other than a written handout. I don't know about providing copies of entire articles . . . . .)
  - It is not widely disseminated. So if you are posting it on the Internet for students, it should be in a password-protected site, so that it is not going to be available to the public.