ENGAGING ENCOUNTERS: KEEPING EVERYONE IN THE GAME BY COMBINING AUDIENCE RESPONSE TECHNOLOGY AND SIMULATION-BASED GROUP EDUCATION

RESULTS

• Participants reported that the use of the audience response system kept them focused on the simulation activity and the discussion at hand.

• Students remain enthusiastically involved in the scenario, regardless of whether they were treating the simulated patient or observing fellow students conducting the treatment.

• Students strongly agreed that the combination of simulation and ARS was engaging.

• In separate programs, both medical students and practicing clinicians reported high levels of satisfaction when ARS was combined with simulation.

• Students strongly agreed that the combination of simulation and ARS was powerfully educational.

• Faculty presenters were able to incorporate the audience response system into ordinary PowerPoint presentations with minimal effort.

• Data can be collected anonymously from the audience or used for student evaluation by mapping the response device to individual students.

• Data obtained from the ARS system can be systematically collected and entered directly into a database to gather group performance metrics.

CONCLUSIONS

• Feedback provided by respondents indicated a very high level of satisfaction with their experiences when simulation was combined with Audience Response System Technology.

• This combination of adult learning methods allows the active engagement of an audience that is typically larger than can be engaged by simulation alone.

• As a classroom technique, this approach was more effective than simulation-based activities alone.

• Faculty were able to incorporate ARS technology and execute real-time operation of the system during the learning encounter with minimal orientation.

• This innovative method presents an important set of possibilities for the future of simulation-based instruction and assessment to expand the use of simulation into larger groups of learners.

• ARS systems can play a future role in the assessment of individual students by collecting response data that is directly mapped back to the student.

• ARS systems can play a role in the comparison of group responses by gathering data longitudinally and entering the data into a database.

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BACKGROUND
- Simulation has emerged as an important, powerful educational and assessment tool across a wide spectrum of students.
- Simulation can bring topics and concepts to life for the student.
- Simulation is effectively used to demonstrate physiologic principles and physical exam skills, bringing topics to life regarding disease processes or variants of physiology.
- Like other methods that work well with adult learners, simulation-based education is typically most effective in very small groups.
  - The utility of simulations with larger groups is thus often limited to simple demonstrations or to participation by only a small team of students, while others observe.
  - Small groups can be expanded if tools are put in place that permit simultaneous active participation in a learning event by all students.
  - Audience response systems (ARS) are a technology that can provide this bridge to a larger audience.
  - ARS technology has been implemented in various learning environments to maintain audience interest, measure understanding and allow instant feedback.

Goals
- Provide an interactive learning forum for audience participants and encourage involvement in an evolving, simulated case designed with specific learning objectives.
- Teach core topic material with an interactive simulation in medium and large group settings.
- Maintain audience participation and engagement uniformly throughout the learning encounter.
- Increase the effectiveness of knowledge transfer over lecture method alone.

METHODS
- We created a unique simulation environment that enables members of medium and large audiences to participate in various learning topics.
- We combine the methods of a pre-programmed medical scenario simulation and ARS technology to engage the audience.
- We created an enhanced small group learning atmosphere with capabilities of hands-on learning along with cognitive participation.
- Audience members view the simulation directly and on three large screen monitors displays:
  - A close up view of a high fidelity simulator.
  - Vital signs monitor.
  - PowerPoint presentation equipped with ARS questions and audience polling answers.
- Three members of the audience come forward and begin to manage the simulated case.
  - At pre-determined breakpoints the simulation is paused.
  - The audience is polled on next actions or treatments that should be performed by the “treatment team.”
  - Three new members of the audience are selected to come forward and to continue the management of the case, based on the direction given by the polling results.
- The response of the audience can be anonymous or linked back to individual students to allow for a testing environment to be created.
- During the transition of audience members, a subject matter expert conducted a structured Q & A with the group.
- Once the next selected performing members were ready to resume the care of the “patient” the simulation continued to cover the next scheduled topic.

An Example
Treatment begins:
1. A critically ill patient is being resuscitated.
2. Vital signs are worsening and there is an immediate need to assist ventilation. Rapid sequence induction medications are administered and the patient is paralyzed.
3. A first attempt at orotracheal intubation fails due to significant swallowing in the pharynx.
4. The patient is repositioned and another unsuccessful attempt at endotracheal intubation is made. The patient’s saturations have fallen to 85%.
5. Pause.
6. Audience question: What is the next immediate step?
   a. Attempt nasotracheal intubation
   b. Attempt trans-tracheal jet ventilation via a needle cricothyrotomy
   c. Attempt fiberoptic intubation
   d. Attempt ventilation with a Fast Trach LMA
7. Within seconds, the audience consensus is immediately and automatically displayed as a graphical image.
9. Treatment resumes using the audience’s consensus recommendation, and the outcome & effectiveness is assessed and discussed with the audience.