

Applying the Principles of Adult Learning to the Teaching of Psychopharmacology: Audience Response Systems

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NEW TREND IN PSYCHOPHARMACOLOGY

Medical presentations can be enhanced by systematically collecting audience feedback. This is readily accomplished with polling systems, called audience response systems. Several systems are now available that are small, inexpensive, and can be readily integrated into standard powerpoint presentations without the need for a technician. Use of audience response systems has several advantages. These include improving attentiveness, increasing learning, polling anonymously, tracking individual and group responses, gauging audience understanding, adding interactivity and fun, and evaluating both participant learning and instructor teaching. Tips for how to write questions for audience response systems are also included.

INTRODUCTION

Applying principles of adult learning to the teaching of psychopharmacology can greatly enhance the effectiveness of a medical presenta-

tion. A previous "Trends in Psychopharmacology" column¹ presented an overview of these principles and also discussed targeting the learner rather than the content or the lecturer as the focus for a medical presentation. Another column² recently covered how to storyboard a presentation as a three act play and how to present the main concepts by utilizing the rule of small multiples. Here we present ideas on audience response feedback systems, how to use them and why.

QUESTIONS FOR AUDIENCE FEEDBACK

Providing learners with feedback or the opportunity for self-evaluation of their learning is extremely important.³ An excellent approach to meeting this need is the use of an "audience response system" (ARS) to pose questions based on information presented. In collegiate settings, these systems are also called "student response systems," "personal response systems," or "classroom communication systems." These response systems allow the instructor to ask questions on-screen at strategic moments in the presentation. Learners are then able to choose a response to questions by pressing a button on the response unit (or "keypad"), sending answers to the presentation computer. These personal response units vary in size—from as

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small as a credit card to as large as a television remote—and most have buttons labeled from 0 through 9. The response system receiver, which connects to the presentation computer, captures responses from students' keypads and shows the results on-screen.

If ARS technology is unavailable, a medical instructor can still pose questions to the audience and ask for a show of hands in response to each question. However, this visible response does have some drawbacks compared to an actual ARS system, as will be discussed.

BENEFITS OF AUDIENCE RESPONSE SYSTEM QUESTIONS

The benefits of ARS questioning are multiple and are outlined here³:

- **Improve Attentiveness and Increase Learning.** A survey of four University of Wisconsin campuses revealed that a majority of the 27 faculty respondents and the 2,684 student respondents agreed or strongly agreed that ARS keypads made learners more engaged in class and were beneficial to learning.⁴

- **Poll Anonymously.** Unlike a show of hands, responses by handheld keypad can be completely anonymous. This provides a learning environment that feels supportive, which is especially needed by some personality types.
- **Track Individual and Group Responses.** Response systems can be used to gather information about learning from each respondent and from the audience as a whole.
- **Gauge Audience Understanding.** In the University of Wisconsin survey,⁴ 100% of the faculty respondents either agreed or strongly agreed with the claim, "Keypads allowed me to assess student knowledge on a particular concept". Students also recognized this benefit for their own self-assessment. Of student respondents, 75% agreed or strongly agreed with the claim, "Keypads helped me get instant feedback on what I knew and didn't know." By revealing to the instructor the level of understanding in the audience, ARS questions can help the instructor address and resolve confusion immediately.

TABLE.
Writing and Optimizing Audience Response Questions³

<i>Before</i>	<i>Problems/Solutions</i>	<i>After</i>
The metabolism of this drug is ____ of the cytochrome system, making the potential for cytochrome-mediated drug-drug interactions ____. A. Dependent, high B. Independent, low C. Dependent, low D. Independent, high	Problems <ul style="list-style-type: none"> • Too many elements (focus on just one) • Fill-in-the-blank is difficult to read aloud Solutions <ul style="list-style-type: none"> • Rewrite as two questions • Rewrite with questions and answers separated (not fill-in-the-blank) 	Which system is responsible for the metabolism of the drug? A. Cytochromes B. Glucuronidases C. Oxidases D. None (drug is not metabolized) Cytochrome metabolism of drugs can lead to which of the following? A. Poor absorption B. Drug-drug interactions C. Weight gain
Patients taking 500 mg of the drug showed an improvement in symptoms of anxiety with a good tolerability profile. A. True B. False	Problems <ul style="list-style-type: none"> • Statement sounds promotional • True/false allows for guessing • Not clear which element (if any) is in question Solution <ul style="list-style-type: none"> • Set just one element apart (dosing or disorder) • Change from true/false format 	Patients taking which dosage of the drug showed an improvement in symptoms of anxiety with a good tolerability profile? A. 50 mg B. 150 mg C. 500 mg Patients taking 500 mg of the drug experienced a good tolerability profile with an improvement in symptoms of which disorder? A. Anxiety B. Depression C. Insomnia

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- **Add Interactivity and Fun.** The novelty and interactivity of response systems can add interest to the learning environment. Respondents can even be grouped into teams, such as diving the room into two sides, and team responses can be plotted against each other on the response screen. This adds a competitive gaming element to learning.
- **Evaluate Participant Learning.** Structuring pretest questions prior to presenting the relevant material and posting test questions afterwards is one of the most efficient ways of measuring learning. Questions should be sufficiently difficult that everyone does not know the correct answer prior to the lecture, yet sufficiently easy so that learners can demonstrate new learning by pre-post comparisons.
- **Evaluate Instructor Teaching.** Measuring learning gains of different lecturers against their ARS keypad questions can show whether the audience learned one section as well as another. Also, in situations where the same materials are presented to similar audiences but by different instructors, ARS questions with pre-post data can provide comparison data on the effectiveness of different teachers. ARS also provides a tool that can aid in discovering and correcting concepts not concisely communicated or perhaps miscommunicated. This “unlearning” aspect of the system helps to optimize information transfer.

STRATEGIES FOR WRITING GOOD AUDIENCE RESPONSE QUESTIONS

A good strategy for using ARS questions is to write several pretest and posttest questions for each section or for the presentation as a whole. The following are some guidelines for writing questions³:

- Questions should focus on key learning objectives, not obscure trivia.
- Questions should not be too easy; a level of

difficulty is necessary to inspire learners to pay attention.

- Avoid the use of trick questions to increase the difficulty.
- Avoid true/false questions, which allow guessing and remove room for improvement and evaluation of learning; if true/false questions must be used, consider also adding a “not sure” option.
- Avoid promotional-sounding statements; the audience members will know they are supposed to agree and will feel coerced or manipulated, potentially reducing the level of esteem the audience has for the instructor and for the information presented.
- Focus questions on just one element, topic, or key message so that audiences know which item is being called into question.
- Avoid fill-in-the-blank questions, which are difficult to read aloud. Keep answers separate and distinct from the question to allow for easy reading. For example, use formats such as, “Which of the following is true?” or “Which dose is recommended?”

Some examples of audience response questions are provided in the Table on the previous page.³

CONCLUSION: QUESTIONS FOR AUDIENCE FEEDBACK

Properly designed audience response questions can increase learning, generate interactivity, and measure progress. Audience response questions can also provide the instructor with an opportunity to clarify areas of confusion and enhance effectiveness.

REFERENCES

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