Everyone Participates in This Class:

Using Response Cards to Increase Active Student Response

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Though most teachers recognize the importance of active student participation, it can be difficult to accomplish during group instruction. A common strategy used by teachers to obtain student participation during group instruction is to pose a question or problem to the entire class and then call on one student to answer. This provides an active learning opportunity for only the student who is called on and often results in more frequent responses by high-achieving students and few or no responses by low-achieving students (Maheady, Mallete, Harper, & Saca, 1991).

There are several alternatives to the one-student-at-a-time method of student participation. Choral responding – each student in the group or class responding orally in unison – is an easy and proven method for increasing active student responding (ASR) during group instruction (Heward, Courson, & Narayan, 1989; Sainato, Strain, & Lyon, 1987; Sindelar, Bursuck, & Halle, 1986). Response cards offer another alternative. This article describes several types of response cards and shows how to use them to engage *all* students in lessons and class discussions.

Using Response Cards

Response cards are cards, signs, or items (such as felt boards) that are simultaneously held up by all students in the class to display their responses to questions or problems presented by the teacher. Not only do response cards enable every student to respond to each question or item, but students can learn by watching others. With response cards, the teacher can easily detect the responses of individual students, which can be difficult with choral responding. Response cards can take many forms, including preprinted and write-on cards.

Preprinted Response Cards

When using *preprinted response cards,* each student selects from a personal set of cards the one with the answer he or she wishes to display. Examples of preprinted cards include Yes/True and No/False cards, colors, traffic signs, planets, science terms, punctuation marks, and concepts such as cause and effect or before and after.

Another type of preprinted response card is the "pinch card." Instead of a set of different cards, each student is given a single preprinted card with multiple answers (e.g., a card with clearly marked sections for math operations or the parts of an orchestra). The student simply holds up the card with thumb and forefinger "pinching" the part of the card displaying his or her answer. Brightly colored plastic clothespins and Velcro-backed cutouts or markers (for felt boards)

make excellent "pinching" tools; students simply clip the pin or attach the marker to the selected part of the response card and hold the cards overhead.

Preprinted cards may also have a built-in, movable device for displaying answers, such as a cardboard clock with movable hour and minute hands, or a wheel and a pointer for choosing and displaying answers (e.g., parts of speech).

Preprinted response cards have several advantages:

- They produce high rates of ASR.
- Instruction can begin with few errors by beginning with only two cards and adding more cards as students' repertoires develop.
- They are easier for the teacher to see than write-on response cards.

Possible disadvantages of preprinted response cards:

- Students are limited to the responses printed on the cards.
- Instruction is limited to recognition tasks.
- They are not appropriate for lessons with a large number of different answers (e.g., 50 states, elements of the periodic table).

Write-on Response Cards

When using *write-on response cards*, students mark or write their answers to each instructional item on blank cards or boards that are erased between each question-and-answer trial.

It's easy to make write-on response cards for each student. To obtain a set of 40 durable write-on response cards, purchase a 4- by 8-foot sheet of white laminated "bathroom board" carried by most builders' supply stores or lumberyards. The cost is generally less than $20, including the charge for cutting the sheet into individual 9- by 12-inch response cards. You can find suitable marking pens at most office and art supply stores. Use "dry erase" markers (one good brand is EXPO) or "China markers." Paper towels or facial tissues will easily wipe clear the dry erase markers. If you use China markers, a bit more "elbow grease" is required to erase answers; old cloth towels work best.

Small chalkboards can be used as write-on response cards, but students' responses may be difficult to see in a full-size classroom.

Write on response cards can also be custom-made to provide an organizing structure or background for students' responses. For example, music students might mark notes on a response card that has permanent treble and bass clef scales. Students in a driver's education class could draw where their car should go on response cards that have various traffic patterns and street intersections shown as permanent backgrounds (Hoagland, 1983).

Berg (1994) created an effective type of "write-on" response card for teaching relational concepts (e.g., on, beside, after) to preschool children with

developmental delays. In response to teacher-posed directions or questions (e.g., "Put your fish *next to* the castle"), each child placed a small Velcro-backed marker (e.g., a little yellow fish) on various places within the background scene on his or her felt response card (eg., a goldfish bowl with a castle and plant inside).

Potential advantages of write-on response cards include:

- Curriculum content and questions for which there are multiple correct answers can be used (e.g., *Q:* What is an alternative energy source to coal-generated electricity? *A:* Solar/Nuclear/Geothermal/etc.).
- Students are not limited to predetermined answers and can give creative responses.
- A more demanding recall-type response is required, rather than the simpler recognition-type response used with preprinted response cards.
- Spelling can be incorporated into the lesson.

Possible disadvantages of write-on response cards are:

- Write-on cards have a lower ASR rate compared to preprinted response cards because of the time needed for writing and erasing answers.
- Error rates are likely to be higher than with preprinted response cards.
- Variations in the size and legibility of students' writing can make their responses difficult for the teacher to see.

Evaluating Response Cards

Response cards have been developed and evaluated through an ongoing series of studies in general and special education classrooms. Several of these studies have compared response cards to hand-raising and one-student-at-a-time recitation, the most commonly used method of student participation during whole-class instruction.

For example, Gardner, Heward, and Grossi (1994) compared write-on cards with hand-raising during science lessons in an inner-city, fifth-grade classroom. *Students responded to teacher-posed questions an average of 21.8 times per 30-minute lesson when response cards were used, but made only 1.5 responses per lesson when the teacher called on individual students to answer.*

The higher participation rate achieved with response cards takes on additional significance when its cumulative effect over the course of a 180-day school year is calculated. Based on the results of this study, *if response cards were used instead of hand-raising for just 30 minutes per day, each student would make more than 3,700 additional academic responses during the school year.*

All 22 students in the class scored higher on next-day quizzes and on 2-week review tests following lessons taught with response cards than they did on quizzes and tests covering lessons where students raised their hands to respond. In addition, most of the students preferred response cards and said they were

"fun" to use and helped them learn more. This pattern of results – *much higher ASR rates, improved test scores, and student preference for response cards*– has been replicated in several other studies in elementary, middle, and secondary classrooms (see Heward [1994] for a review).

Suggestions for Using Response Cards in the Classroom

You can adapt and incorporate response-card activities in many ways to best meet your instructional objectives and fit your students' current levels of performance. For example, students might use write-on response cards to display their answers as the teacher demonstrates how to solve a new type of math or geometry problem. During a language arts lesson, students might select and hold up preprinted response cards showing parts of speech (e.g., noun, verb, preposition) as their teacher points to various words in a projected sentence. When the students consistently recognize parts of speech, their teacher can switch to write-on response cards, elevating the lesson to a higher level of knowledge that requires students to recall each part of speech. Response cards might be used during the last 5 minutes of the period in a high school science class to review the day's lesson (Cavanaugh, Heward, & Donelson, 1995).

Response cards are likely to be more effective when used to give students many active responses within a short period of time (e.g., 5 to 10 minutes) than if used for single responses sporadically during the class period. You can combine the use of response cards with other high-ASR strategies to create a learning environment in which students actively participate and receive feedback for those responses throughout the school day or class period. For example, a science teacher at the secondary level might incorporate choral responding, guided notes, hands-on laboratory activities, response cards, and time trials within a 50-minute class period like this:

> (1) the lesson begins with 3 to 5 minutes of choral responding in which students "warm-up" for the day's lesson by reviewing concepts they have been learning; (2) students then complete guided notes during a 15-minute lecture or demonstration by the teacher; (3) for the next 20 minutes, small groups of students perform hands-on laboratory experiments, perhaps filling-in a structured worksheet with key procedural steps, results, and observations; and (4) on some days response cards are used during the last 5 minutes of the period to review the day's lesson, whereas on other days the period ends with two 1-minute time trials as a maintenance and fluency-building activity for concepts learned in previous lessons. The actual time spent with each activity would, of course, vary from day to day, and 5 minutes are left unscheduled to allow for transition time. (Heward, 1994, p. 312)

General Suggestions for Using Response Cards

Based on anecdotal observations and the empirical results of the classroom evaluations of response cards conducted to date, we can offer the following suggestions:

- Model several question-and-answer trials, giving students practice on how to use the response cards.
- Maintain a lively pace throughout the response cards portion of the lesson (i.e., keep the intervals between trials short [Carmine, 1976]).
- Provide clear cues when students are to hold up and put down their cards (e.g., "Cards up"; "Cards down").
- Provide feedback based on the "majority response" (Heward et al., 1989). When you see only correct responses, provide a quick and positive comment (e.g., "Great!" "You're right!") and present the next item or question. When you see just a few incorrect responses, state or point out the correct answer (e.g., "Yes, the word 'barn' is the predicate noun in that sentence").
- When a significant number of incorrect responses are displayed – perhaps a fourth or more of the class – state or display the correct answer and immediately repeat the same question or item. Check the effectiveness of corrective feedback by repeating, several trials later, any item for which you saw incorrect responses.
- Remember that students can benefit and learn from watching others. Don't let students think it's cheating to look at classmates' response cards.

Specific Suggestions for Using Preprinted Response Cards

- Design and construct the cards to be durable and as easy to see as possible (e.g., consider size, print type, color codes).
- Make the cards easy for students to manipulate and display (e.g., put answers on both sides of the cards so students can see what they are showing the teacher, attach a group of related cards to a ring).
- Begin instruction on new content with a small set of fact/concept cards (perhaps only 2), gradually adding additional cards as students' skills improve.

Specific Suggestions for Using Write-on Response Cards

- Limit language-based responses to 1 or 2 words.
- Keep a few extra marking pens on hand, and remind students to cap them tightly when the lesson is over.
- Be sure students do not hesitate to respond because they are concerned about making spelling mistakes. You might use one or a combination of these strategies: (a) provide several practice trials with new words or terms before the lesson begins; (b) write new words or important technical terms on the chalkboard or an overhead projector and tell students to refer to them as needed during the lesson; or (c)

use the "don't worry" technique – tell students to try their best but that misspellings won't be counted against them.
- Students enjoy doodling on their response cards. Let students draw on the cards for a few minutes after a good lesson.

Benefits of Increasing Active Student Response (ASR)

More Learning

A large and growing body of educational research on the relationship between student participation and academic achievement has made one finding very clear: *Students who respond actively and often to ongoing instruction learn more than students who passively attend.* (For reviews of this research, see Fisher and Berliner [1985] and Greenwood, Delquadri, and Hall [1984]). Active student response (ASR) is a direct measure of student participation in the classroom. ASR occurs each time a student makes an observable response to ongoing instruction.

> The kinds of responses that qualify (as ASR) are as varied as the kinds of lessons that are taught. Depending upon the instructional objective, examples of ASR include words read, problems answered, boards cut, test tubes measured, praise and supportive comments spoken, notes or scales played, stitches sewn, sentences written, workbook questions answered, and fastballs pitched. The basic measure of how much ASR a student receives is a frequency count of the number of academic responses emitted within a given period of instruction (Heward, 1994, p. 286).

All things being equal, *a high ASR lesson will produce better achievement than one in which students make few active responses to the lesson's content.*

Increased On-Task Behavior

Several studies have found increased levels of on-task behavior and reduced off-task or disruptive behavior as correlates or functional outcomes of increased ASR (e.g., Carnine, 1976; Miller, Hall, & Heward, 1995; Sainato, Strain, & Lyon (1987). On-task behavior is a weak correlate of learning and should not be the primary goal of any intervention designed to increase achievement. A student can be perfectly on-task yet make no meaningful responses to the lesson. However, increasing the degree to which students pay attention and do not disrupt others during instruction has some important advantages:

- The on-task student is more likely to see and hear important instruction than the student who is off-task or disruptive.
- Peers are better able to see and hear instruction when a student's disruptive behavior is reduced.
- Teachers are pleased when their students are well-behaved and are more likely to use instructional strategies associated with increased on-task behavior

Immediate Feedback for the Teacher

Teachers often check the effectiveness of an ongoing lesson by asking students, "Do you understand?" But the feedback provided by this type of check can be misleading. Students will sometimes answer "Yes" when, in fact, they do not understand, because:

- "Yes" answers are greeted with smiles and nice words from the teacher, which serve to reinforce saying "Yes."
- They don't want to admit to not understanding when all of their peers are nodding their heads and seem to understand.
- "Yes" answers avoid aversive consequences from the teacher, such as disappointed looks, recriminating questions, recommendations to "pay better attention" next time, or - worst of all for the whole class - a repeat of the entire demonstration or explanation.
- They don't know they don't understand. Some skills look easy when performed and explained by the teacher; but watching and doing are not the same thing.

When a brave soul does admit to not understanding, the teacher usually probes further to determine *what* the student does not "understand." This probing can be aversive to both teacher and student, perhaps causing the teacher to avoid asking students (at least that student) if they understand and encouraging students to say they understand whether or not they really do.

These potential problems are avoided when ASR occurs frequently throughout a lesson. *ASR provides immediate and ongoing feedback on students' learning, so the teacher never needs to ask, "Do you understand?"* The accuracy and fluency with which students respond help the teacher determine what instructional changes, if any, might be made during the lesson itself in an effort to improve the lesson's effectiveness "on the spot."

When instruction includes high ASR activities, not only is it hard for students to simply passively attend, it is equally difficult for teachers to avoid direct and frequent feedback on the effectiveness of their teaching. Thus, teachers maintain the close, continual contact with relevant outcome data they need to make good instructional decisions (Bushell & Baer, 1994).

A Final Note

Providing students with frequent opportunities to respond is one of the most powerful means teachers have for increasing academic achievement. Not only are the outcomes of increasing active student responding significant, but the means for providing these opportunities are currently available to the practitioner. Active student responding is neither a hard-to-pin-down hypothetical construct nor a variable, such as socioeconomic status, on which the teacher can hope to have little or no effect. *ASR is,*

as Bloom (1980) put it, an "alterable variable" – one that both makes a difference and can be affected by teaching practices. Response cards provide a proven, easy-to-implement, low-cost, and effective strategy for increasing ASR.

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