Involving Students in Learning

As educators, we are well aware that students who are actively involved in their own learning learn more. Try as we may, we can't learn for them.

Fortunately, teachers of agriculture have lots of opportunities to actively involve students in learning. For example, think of all the ways we involve students in agricultural mechanics skills and projects; in horticulture and forestry work; and, most of all, in their own supervised agricultural experience programs. It may be that we are a bit remiss, however, when learning takes place (or is supposed to take place) in the agriculture classroom. When we note that we tend to learn about 10% of what we read, 10% of what we hear, 30% of what we see and hear, 70% of what we ourselves say, and 90% of what we see, hear, say and apply, we may want to examine our own teaching approaches.

We teachers tend to lecture more than we should (no active involvement here). While we may learn a lot by lecturing, students may only retain 10% or so of what we tell them and that for only a short period of time. (No wonder teachers know so much, we're always talking!)

A favorite assignment is to ask students to read a chapter in a book (not much active involvement here either). They may retain 10%, maybe a bit more if they are to "answer the questions at the end of the chapter."

Or we show a video (not much involvement here). But, assuming the video has sound, students will learn somewhat more because of both audio and visual stimulation.

Now, let's put some of this information into a strategy that is guaranteed to increase classroom learning. This strategy involves a bit of effort on the part of the teacher, but the payoff is in terms of increased interest, motivation, and learning. It prepares students to learn by asking them to react to a series of statements related to the content of the material to be covered. By reacting to the statements, students anticipate what the material will be about. And once the student has reacted, s/he has a purpose for reading. Student interaction in small groups both before and after reading can help in the process of comprehension and retention (Remember? We learn by expressing ourselves.) Finally, class discussion allows the teacher to mediate disagreements and for the class to reflect on the material and to reach consensus, all in an environment which stimulates critical thinking on the part of students.

To prepare the reaction materials, the teacher must:

1. Review the material for major concepts to be learned.
2. Write statements that (a) force students to interpret a paragraph or two of text, and (b) are worded to provoke critical thinking about the key concepts. (Statements should be somewhat vague or subject to interpretation; they may be true-false or multiple choice.)
3. Make it clear in the instructions that students should be able to present evidence to defend their choice of answers.

The process goes something like this:

Before reading:

1. Students individually read and respond to statements.
2. Students are then placed in small groups to discuss which answers they chose and why they did so.

During reading:

3. Students read the material, keeping the statement sheet in front of them, confirming or revising their original answers.

After reading:

4. Students return to the same small groups to discuss and come to group consensus about the correct answers. (Remind them to provide evidence in order to convince others.)
5. Take the selections of the group which finishes first in coming to consensus. Share these answers with the entire group, and moderate discussion as the entire class tries to reach consensus. (Sometimes the discussion will not result in consensus. The process, however, is the valuable part of the exercise—students exercising critical thinking by the nature of the discussion.)

As an example, suppose your upper-class students are studying science concepts in soil fertility. Based upon pp. 101-111 in Physical Science Applications in Agriculture, by Buriak and Osborne (Interstate), you would develop an Anticipation Guide something like the following:

Soil Fertility

Instructions: Place a check mark (✓) next to each statement below with which you agree. Then during or after the reading, cross through (✗) any you checked earlier but about which you have changed your mind. You can use the space below each statement to make notes or to note the paragraphs or prior experiences from which you can cite supporting evidence.

_____*1. A soil that contains N, P, and K is considered to be fertile.*

_____*2. Since nitrogen makes up about 70% of our atmosphere, plants get plenty of nitrogen.*

_____*3. Nitrogen in the soil is "fixed" and can only be lost through plant use.*

_____*4. Plant nutrients exist in the soil as ions that are adsorbed by plant roots.*

_____*5. Acid soils have an abundance of Ca and H ions.*

_____*6. A soil test measures macronutrients and micronutrients in the soil.*

Following individual student response to the statements, students would next discuss their responses in small groups, read the material, reassemble in small groups to reach consensus, and finally attempt to reach consensus as an entire class. This technique provides focus and motivation, involves students in actively searching for information and verbalizing their thoughts with peers, and greatly improves their chances of learning essential information. While the process described is valuable in that it improves reading comprehension, it can also be used with lecture or video as the source of information.