How to Help Students Remember and Understand

“Weren’t they listening?”
Has this happened to you? –
☐ You tell the students the information they need to know, but five minutes later they’re asking questions that make you think they never heard what you just said.
☐ Students can recite back parts of what you told them or what they read, but don’t seem to be able to apply it to solve problems or answer discussion questions.

This handout explains why this might happen and what you, as a TA, can do about it.

Three Key Processes that Lead to Meaningful Understanding
According to the generative theory of learning (Mayer, 1997), in order for meaningful learning to take place (as opposed to rote learning), students need to successfully engage in the following three processes:

1) Selecting – knowing what to pay attention to; being able to distinguish relevant from irrelevant material; identifying the most important ideas.

2) Organizing – being able to organize the material into a coherent representation; seeing how concepts relate to each other (e.g. cause and effect, etc.)

3) Integrating – connecting these new ideas with their existing knowledge.

☐ Students, especially those unfamiliar with the material, often need guidance to help them process and make sense of what was said.

So, what can you, as the TA, do to help them?

☐ Use SIGNALING when you explain material or lead discussions

Signals are explicit cues that:
• Emphasize what content is most relevant
• Emphasize how ideas, concepts, terms are organized and how they relate to each other

Suggestions for how to apply signaling in discussion and lab sections:

1) Start with a “Title” that indicates the main purpose or themes of that day’s section.
   Example: Write it down on the board, or if that’s not possible, state it clearly before class starts
   Rationale: Titles and headings label the dominant theme of the section providing a framework to help students select and focus on the main point; it gets them “ready to learn.” (Lorch, 1989; Meyer, 1975).
2) Do a brief preview at the beginning, and/or a summary near the end of discussion.
   Examples: □ write an outline on the board with some of that section’s main points
               □ before starting, give examples, ask general questions, and tell them that these are the topics that you’ll be addressing today
               □ before finishing, ask students to generate the main points of the discussion while you summarize them on the board.
   Rationale: It helps students see how main concepts or themes might be related. It repeats the central points and helps them keep them organized in their minds.

3) Use enumeration signals to help students keep track of main points
   Example: Create short lists: “There are three main points you need to keep in mind…,” “First….. Second … Finally…” “What are the three main reasons we discussed…”
   Rationale: These devices make the topic structure more explicit. They help students see how the points are related, help them notice sequencing, and help them retrieve the information later on.

4) Use explicit connecting phrases to emphasize how main points are related.
   Example: Insert phrases like, “Because of this…” “As a result…” “Therefore…” in your explanations
   Rationale: Phrases like these help make connections between concepts more explicit thereby reducing ambiguity about how two ideas may be related. They generally point out cause-effect relationship and help students make appropriate inferences. This is especially important when students may not have adequate prior knowledge of the subject to know how two concepts might relate.

5) Use relevance indicators to emphasize the importance of certain points.
   Example: Say things like, “It’s important to note” or “This is a major reason why…”
   Rationale: These devices identify which information is relevant to the topic, and therefore, which information may be important for students to remember

6) Use vocal emphasis and pausing
   Example: When making a key point, slow down your speech and use a different intonation to emphasize the significance of the point. This is the equivalent of bolding or italicizing in text.
   Rationale: This makes the key points stand out more, and gives students time to process what was said.

Summary
□ Signaling helps students engage in the processes of selecting, organizing, and integrating information – processes which are key to constructing meaningful understanding.
□ If you are explicit about what’s important, how concepts are related, and where it all fits into the big picture, then students will not only be more likely to remember the information, but they are also more likely to be able apply it to solve problems and to relate it to other concepts in the future.
Research Evidence

In a recent study on campus, experimenters gave two groups of college students a short text on how airplanes achieve lift. The passages that each group received were identical except that one had a few signaling devices added, including a couple of headings, a brief overview paragraph (“There are three main points you need to focus on…”), and a few connecting phrases (“because of that” and “as a result”). No additional content was added, just these few signals. The students were then tested on how well they could remember and apply the information to solving problems. Those who received signaling did significantly better on the problem-solving tests. This was especially evident in a second study in which the students just heard a recording of the passage, rather than read it. This supported numerous other studies that demonstrated that adding a few signals really pays off in helping students understand and remember unfamiliar material. (Mautone & Mayer, 2001, Loman & Mayer, 1993; Lorch, 1989; Meyer, 1975).

References


