

## Assessing Memorization vs. Understanding

**Diane L. Willey, Director of Educational Research and Assessment**

A number of systems presently exist for categorizing educational outcomes. The best known of these is Bloom's (1956) cognitive Taxonomy of Educational Objectives. While the taxonomy is helpful for thinking about learning outcomes, it does not always clearly show how to structure the assessment tasks. This article describes an approach to constructing tasks which assess not only memorization, but also understanding of ideas and application of discipline concepts and principles.

In planning and teaching courses, I have found it helpful to think about cognitive learning outcomes in three categories: 1) information to remember; 2) ideas to understand, and; 3) concepts and principles to apply.

The assessment of each type of outcome requires tasks which are structured in different ways. These assessment tasks could be presented as test questions, papers, projects or performances. However, we can't just spring these tasks on students unannounced.

### Memorization

Remembering information is the most familiar learning outcome and the easiest to assess. Because it is so easy, we often over-emphasize this type of learning outcome, rather than thoughtfully selecting the information to be memorized.

The keys to effectively assessing memorization are presenting exactly what the student is to learn, providing time for rehearsal in class or as homework assignments and presenting an assessment task which is IDENTICAL TO the rehearsal task.

For example, if we want students to "know" the different types of variables in scientific experiments, we

usually mean that we want them to recall this information on demand. We need to tell the students which specific types of variables we expect them to recall and allow sufficient time for them to memorize the information.

If we want the information spelled or pronounced correctly, we also need to tell the students so. The assessment task might be questions presented on a test, in class or even to a team in a game format like Jeopardy. The variables asked for in the assessment task must be the same ones we told the students to memorize. No surprises!

Recently, discussions on the learning outcome for memorizing information have focused on two different issues—the particular information that should be memorized by an educated person and the need to reduce the excessive focus on memorization and increase emphasis on understanding and application.

### Understanding

The key to assessing understanding is to create tasks that have NOT been encountered by the student in previous assignments or class activities. Learning tasks should provide NEW questions, examples, cases or situations.

For example, suppose I want students to demonstrate that they understand the concepts of independent variables (IV), dependent variables (DV) and controlled variables (CV) in experiments. Tasks to assess students' understanding of these ideas could include having students define IV's in their own words, describe key characteristics of DV's, and identify similarities and differences between

IV's and CV's. I also could phrase a definition in different words from those used in class and ask the students to identify the concept being defined, or present an inaccurate description of characteristics of a DV and ask the students to tell me whether or not it is accurate and explain their reasoning or correct the errors.

Any of the same tasks could be used for learning rather than assessment. The KEY, however, is that a particular task should not be used for both learning and assessment.

### Application

Assessing application of these concepts might involve giving students descriptions of experiments and asking them to identify the various variables or asking them to select appropriate variables for an experiment to test a particular hypothesis. As with assessment of understanding, DIFFERENT examples of experiments must be used in the assessment and learning tasks. If I give the students the same examples for the assessment that were presented in class or assignments, then I am merely assessing how well they memorized the practice examples.

To successfully assess students' ability to remember information, understand ideas, and apply concepts and principles, we need to provide students not only with appropriate assessment tasks, but also with similar types of tasks as learning activities.



### Why Do I Teach?

**Lana Wachniak, Associate Professor of Sociology and Criminal Justice. Six years at KSC.**

*"I teach because I enjoy seeing the bulb light up in a student's mind when he or she has learned something new, or has learned a new way of looking at something."*