POD —IDEA Center
Learning Notes

IDEA Learning Objective #1:
"Gaining factual knowledge (terminology, classifications, methods, trends)"

Michael Theall, Youngstown State University, mtheall@ysu.edu

Background

The foundations of any discipline are its definition, knowledge base, terminology, structure, methodology, and epistemology. As we move from basic knowledge to the complex organization and hierarchies of information in the disciplines, we parallel the levels of Bloom's cognitive taxonomy (1): knowledge, comprehension, application, analysis, synthesis, and evaluation.

IDEA Objective 1 deals with acquisition of basic information upon which more complex learning relies. While traditional teaching methods, especially lecture and readings, are quite efficient at "delivering" this kind of information, the question is whether "delivery" is enough. Simply having the information at hand does not guarantee that students will understand it or know how to learn it. Are there ways to help students learn the material more effectively and also be able to use the information as they move into more complex cognitive tasks?

Research (2) has shown that there are two essential tasks to foster student achievement: help students see the relevance and importance of the information, and make it understandable. In fact, the dimensions of teaching that are the strongest correlates of student achievement are: 1) preparation and organization; 2) clarity of communication; 3) perceived outcome of the instruction; and 4) stimulating student interest in the course content. The first two concern the organization of information and its effective presentation and have traditionally been part of a teacher's preparation. The second two deal with motivation and engaging students in their learning.

If students understand why information is important and useful, if their curiosity is piqued, if they are appropriately challenged, and if they perceive relevance of the content, they will be willing to exert more effort and will perform better as a result (3, 4). From a different, but nonetheless important perspective, these same dimensions are among the most strongly correlated with overall student ratings of teaching and courses (2, 5).

Teachers must possess a great deal of different kinds of knowledge. Lee Shulman (6) has identified three general kinds of knowledge required by teachers. The first is "content knowledge," an obvious and necessary ingredient. The second is "pedagogical content knowledge," or understanding of pedagogy, teaching and learning, and its application to the discipline. Finally is "curricular knowledge," an enhanced version of the latter where the teacher has a repertoire of strategies, materials, approaches, and alternatives that are called on to help students learn. Master teachers, by Shulman's definition, also possess the ability to take the principal concepts of the discipline and translate them into language, demonstrations, or activities that students can understand. In other words (and particularly in introductory courses where students most frequently have to learn terms, definitions, classifications, etc.), the teacher provides both the organizational structure and the appropriate level of complexity for the students. Quite simply, this makes learning easier, promotes success and enhanced efficacy (7), and creates a positive motivational cycle in which students become more and more willing to work and reap both intrinsic and extrinsic rewards as a result.

However, structuring and organizing information and activities does not mean exercising complete control over all aspects of the course. Making a course "learner centered" (8) can help you to get your students more deeply engaged in the content, and it can promote the kind of "deep learning" (9) that characterizes academic success.

If possessing basic knowledge is critical to deeper understanding, it follows that this objective should relate to other IDEA objectives that deal with cognitive gains. This is the case, as Objective 1 is very strongly related to Learning fundamental principles (Objective 2), Learning to apply course material (Objective 3), Developing specific professional competencies and skills (Objective 4), and interestingly, Acquiring an interest in learning more (Objective 12). The positive motivational cycle at work again!

Helpful Hints
IDEA research has identified a number of specific teaching methods that are related to Objective 1. The most important seem to be Demonstrating the importance of the subject matter (Item 4), Stimulating intellectual effort (Item 8), Using assessments that cover important points in the course (Item 12), and Introducing stimulating ideas (Item 13). It is obvious how these relationships reinforce the research referred to above: motivation, organization, and clarity lead to successful acquisition of knowledge level objectives. The relevance of these methods is also apparent in many of the following hints.

Incorporate motivational strategies into your teaching. The most productive motivational strategy is one that considers the entry characteristics of students, adapts instruction accordingly, demonstrates relevance of the content, provides opportunities for success, and leads to the satisfaction of positive performance (3). The intrinsic motivation that results has been related to brain function in the sense that successful execution of a task based on personal effort is a powerful emotional force. As Zull (10) points out, motivation is intensified when a student can say, "I did it myself." Thus, using activities that allow students to find information, to organize it in meaningful ways, or to use it, all have the potential to provide opportunities for success and intrinsic motivation. This applies even to learning basic information because students can acquire some of that information/knowledge through their own efforts as well as through a teacher's effective presentation

and organization. When students passively sit and listen to 50 minutes or more of a lecture, they have little investment in learning except to do it in order to pass a test and get a grade.

Be a role model for learning how to learn (meta-cognition). You can exhibit skills that help students to see structure, to relate topics, and to organize information. When you do this kind of modeling, you provide a meta-cognitive assist. Students who follow your example are not only discovering what to learn, but how to learn it. A teacher who says, "This is how we approach a problem in our discipline" or "This is how I would go about answering this question," is showing students a process that is transferable. It isn't necessary to provide an answer to a problem – students can work on that. Even when dealing with knowledge level objectives, a teacher can show students how topics relate to and build on each other. Combining the modeling process with carefully chosen questions that lead students from one point to another is another strategy for engaging students in meta-cognitive activity.

Use teaching strategies that directly connect to the objective. There are many ways to enhance your skills in organizing information for students and to get them engaged with you and your content. With respect to organization and presentation you can attend to what Harry Murray (11) has called "low-inference behaviors". That is, specific and observable teacher behaviors that help students learn. For example, Murray notes that for more effective explanations, a teacher can use concrete examples, repeat difficult concepts, or stress important points. Hativa (12) has gone further, describing "upper," "intermediate," and "lower" levels of low-inference behaviors. For example, one set of behaviors targets clarity of explanation. An intermediate behavior in this category would be "simplifying the material presented." This behavior could be broken down into "teaching in two or more cycles," "teaching in small steps," "using simplified verbal presentations," and "providing further support after direct instruction." Each of these behaviors promotes more effective learning of facts.

The IDEA teaching methods and strategies related to this objective should also be considered. The POD-IDEA Center Notes cited at the end of the paper should be helpful.

Consider using active learning or team-based methods. Content-heavy courses may not seem to be the right places for instructional methods that

have been shown to enhance conceptual learning, but conceptual understanding can often help students make sense of the facts, terms, and organization of the subject. It is the disassociation of facts, the frequent error of students presuming that memorization of bits of information is learning, that can be overcome by creating engaging problems and encouraging teamwork (13). When you ask students to organize information or place it in context (and that, in itself, can be a team assignment) you help them to construct more complete knowledge. Concept maps (14) are useful at this level because they provide a structural picture of the relationships of information and concepts. Students benefit from a clear description of how concept maps are constructed and with some training, they can use the technique themselves. In teams, they can then compare their work and discuss their reasons for their organization of the information. Of course, you will have to include some review of the team decisions in order to verify that students are on the right track, but this is a beneficial activity in itself, since it provides a review of the thought process needed to arrive at the correct response.

Assessment Issues
Almost any kind of strategy for tracking student progress will be useful (15). When the objective is for students to learn basic facts, the assessments you choose should provide direct evidence of knowledge, and if possible, they should also link that knowledge to deeper understanding of the material. Here are some strategies.

Collect formative evaluation data. Courses that most often require students to learn basic information are frequently offered in the first year and in large-enrollment settings and thus, they pose particular challenges. Your students probably have little experience with the content and they may not have sophisticated learning skills, so it is important to keep track of their progress and problems. You cannot wait until mid-semester or later to assess learning, and, keeping in mind the motivational notes above, it is often the case that non-graded assessments will be most effective in promoting learning without the threat of failure or possible discouragement that comes with errors.

One effective technique for following progress is the use of knowledge surveys (16). These assessments ask students to estimate their knowledge and/or their confidence in their ability to respond correctly to questions. When their estimates are contrasted

to actual responses, students become more aware of what they do and do not know, and the areas that need attention. When you and your students know what needs attention, both teaching and learning become more efficient.

Another approach that has been successful is to use new technologies, such as student response systems. These require remote devices sometimes called "clickers" that students use to answer in-class questions. These systems can then display the responses with two beneficial results – you can immediately see the level of student understanding and you can follow-up with other questions or involve students in a discussion about correct answers and students' reasons for their choices (see IDEA Paper No. 43).

Complete the feedback cycle. As noted above, assessment with feedback is most beneficial for student learning. No matter what technique is chosen, the objective is not simply to determine right or wrong, but rather to focus on why a given answer is correct and on the process used to arrive at that answer. There are various ways to provide feedback. Some, like the response systems described above, provide feedback immediately. Some, like team review if individual work, provide feedback as part of their process. Face-to-face feedback is always useful, but there are other ways to keep students apprised of their progress. You can use technology (e.g., course management systems) to respond to student work in on-line or hybrid courses. In some of these courses, direct contact by telephone can be very effective. Whatever the methods used, the most effective feedback is that which is clear, focused, supportive, and includes information about strengths as well as specific recommendations for improvement.

References and Resources
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(5) Franklin, J. L., & Theall, M. (1995). The relationship of disciplinary differences and the value of class preparation time to student ratings of instruction. In N. Hativa & M. Marincovich, (Eds.), "Disciplinary differences in teaching and learning: implications for practice." *New Directions for Teaching and Learning # 64*. San Francisco: Jossey-Bass.

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(11) Murray, H. G. (1983). Low inference classroom teaching behaviors and student ratings of college teaching effectiveness. *Journal of Educational Psychology, 71*, 856-865.

(12) Hativa, N. (1999). Towards a conceptual framework of dimensions of effective instruction: the role of high-, intermediate-, and low-inference teaching behaviors. In Theall, M. (Ed.) *Instructional Evaluation and Faculty Development, 19* (1), 3-12. Retrieved September 20, 2006 from http://www.umanitoba.ca/uts/sigfted/iefdi/iefd19-1.htm

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(14) Novak, J. D. (1998). *Learning, Creating, and Using Knowledge*. Mahwah, NJ: Lawrence Erlbaum.

(15) Angelo, T. A., & Cross, K. P. (1993). *Classroom assessment techniques: a handbook for college teachers.* San Francisco: Jossey-Bass.

(16) Nuhfer, E., & Knipp, D. (2003). The knowledge survey: a tool for all reasons. *To Improve the Academy, 21,* 59-78.

Related POD-IDEA Center Notes

IDEA Item #4 Demonstrated the importance and significance of the subject matter, Nancy McClure

IDEA Item #8 Stimulated students to intellectual effort beyond that required by most courses, Nancy McClure

IDEA Item #12 Gave tests, projects, etc. that covered the most important parts of the course, Barbara E. Walvoord

IDEA Item #15 Inspired students to set and achieve goals which really challenged them, Todd Zakrajsek

Additional Resources

IDEA Paper No. 14: Improving Lectures, Cashin

IDEA Paper No. 15: Improving Discussions, Cashin and McKnight

IDEA Paper No. 16: Improving Multiple-Choice Tests, Clegg and Cashin

IDEA Paper No. 24: Improving Instructors' Speaking Skills, Goulden

IDEA Paper No. 41: Student Goal Orientation, Motivation, and Learning, Svinicki

IDEA Paper No. 43: The Technology Literate Professorate: Are We There Yet? Madigan