

SWAP SESSION NEWSLETTER

No. 4

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Topic- Levels of Learning: Memorization and Beyond

Ideas were presented by Dr. Steve Thien, Professor of Agronomy, and Dr. Gail Shroyer, Associate Professor of Elementary Education.

First, Dr. Thien provided an explanation of Bloom's Taxonomy, which he views as a great guide for describing cognitive levels of learning. The Taxonomy consists of 6 levels of learning that build upon one another in a hierarchy. The first level of learning is Knowledge, followed by Comprehension, Application, Analysis, Synthesis, and Evaluation.

Key points made by Dr. Thien about the 6 levels of learning in Bloom's Taxonomy are the following:

KNOWLEDGE: The behavior emphasized at this level of learning is that of remembering. This is a necessary level of learning. One typically cannot go on to the next level until one has accomplished this step. We (professors) know how to teach and test at this level. We are skilled at this level.

COMPREHENSION: Concepts are those which require the learner to translate, interpret, predict, or extrapolate. Caution: You can't teach comprehension on a topic and then ask for the very same thing on an exam. If you do, that is no more than a knowledge level exercise.

APPLICATION: Here, the task is to be able to solve problems in new situations. The student applies a skill outside of the context in which it was demonstrated in class.

ANALYSIS: The analysis level of learning requires the learner to breakdown or separate material into parts that can be examined for the existence of relationships.

SYNTHESIS: At this level of learning, students create something that wasn't there before. (Example- Writing a thesis)

EVALUATION: This, the highest level of learning, involves making judgments about something using self-produced criteria or standards. Graduate students should be operating at this level.

Dr. Thien emphasized that all along these 6 levels of learning, the professor should be thinking about the following:

- *How can I teach at this level?
- *How can I demonstrate learning at this level?
- *How can I require this level of learning back from my students?

Dr. Gail Shroyer provided information about the learning process and explained how to teach for understanding. The following points were addressed:

1. As one moves up Bloom's hierarchy, one is addressing more meaningful learning, deeper learning, and higher level thinking.
2. From birth, we attempt to make sense of the world around us. The positive side to this is that students come to classes with existing ideas, beliefs and understandings. The negative or down side is that this prior knowledge may be notably different from "accepted knowledge" in the field of study. These misconceptions are intact and very resistant to change. Students tend to retain what they have spent a lifetime building. This presents a challenge for educators.
3. Dr. Shroyer summarized a research study presented in a series of videos titled Private Universe. This series documents interviews with college students. One set of interviews involved graduating seniors from Harvard University. The interviewer asked them questions like "What causes the seasons?" and "What causes phases of the moon?". The students typically responded with anything except the scientific reasons. The researchers also asked the same questions of students who had just left classes like Astronomy. These students could respond correctly on a surface level, but when probed further, they behaved like the Harvard students.
4. Not only is it important to start out at the knowledge level, but one also has to make sure to start at the correct knowledge level. This requires finding out what students already know.

TEACHING FOR UNDERSTANDING:

*It is important to focus on prior knowledge: Dr. Shroyer uses reflective writings. Students respond to questions of the day or questions of the week. These questions “pull it all together”, and deal with the concept of the week. They are higher level questions that aim to find out what the students are thinking. She also uses group discussions or asks groups to write a definition or description of a concept before and after instruction.


*Use a variety of instructional approaches. Those who have the greatest variety of instruction are those who learn the concept at a deeper level and remember it.

*Learning is a social process. It is important to encourage students to interact and exchange ideas.

*We are seekers of meaning. Therefore, it is vital to provide relevant examples and demonstrate relationships among concepts.

*The affective dimension to learning is equally important to the cognitive dimension. The students have to believe they can learn the topic. A nurturing, supportive environment is conducive to this learning.

*We have been teaching more concepts and students aren't learning them. Conceptual understanding takes time. “Less is more”.



After the panel members spoke, they asked the audience members to form discussion groups of six. The groups were given an article to read and then were asked to work together to come up with six questions about the article, one for each level of learning.

Some responses and reactions from the groups include:

- * No one had trouble writing a knowledge question.
- * Some had trouble writing comprehension and application questions and commented that it is easy to blend the levels when coming up with a question.
- * It is important to decide the main concepts you wish to emphasize before writing the questions.

* Dr. Shroyer pointed out that when Bloom's Taxonomy was first introduced, people thought it needed to be taught in a very linear fashion with each level as a separate domain. Now, people see there is a lot of overlap, and this is probably how it is supposed to be.

* Bloom's Taxonomy emphasizes the cognitive level. There is equal merit to the affective level.

* Some of Bloom's levels are important to master before the others. For example, Comprehension seems necessary in order to move on to the other four.

* Open-ended questions allow students to express their unique experiences.

* Just because one knows how to analyze doesn't mean he or she knows how to write about it. We need to teach students how to answer questions and how to record responses.

* The flip side to the point above is also true. Some students can write about math problems, but they are unable to solve them.



Announcements:

1. The next Swap Session will be on **Tuesday**, March 17, at 3:30 pm in the Hemisphere Room in Hale Library.
Topic: Assessment and Evaluation of Learning
Presenters: Dr. Vicki Clegg, Educational Advancements
Dr. Allan Goodman, Architectural Engineering and Construction Science
2. Web page address: <http://www.ksu.edu/biology/scholar>