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## *Best Practices*

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### **The Role of Lecturer as Tutor**

The hallmark of effective tutoring lies in two principles as outlined by Wood & Tanner (2012). First, in order for students to learn they need to do the work. That is, the student needs to do the explaining, not the tutor. The more self-explanation that the student does, the more positive the learning outcomes will be. We learn by doing not by being told how to do it. A big part of the doing involves talking it through out loud. Second, the amount of talking that tutors do should be kept to a minimum. The outcome of tutoring, student learning, is greatest when the tutor keeps his/her talk suppressed. Let the student do the talking! The point of this article and the supporting research, is that we don't learn by being lectured to. Your tendency will be to want to explain, to tell the student how and why. We are telling you to resist this. Instead, you want to do all that you can to get the student to talk, to do, to explain.

What are some of the main points from the Wood & Tanner article?

1. Let your tutee do the work.
2. Let your tutee do the talking.
3. Come prepared to your tutoring sessions.
4. Ask your tutee questions.
5. Build a relationship with your tutee; show that you care.

### **Cognitive Apprenticeship: Making Thinking Visible**

Cognitive Apprenticeship takes the principles of traditional apprenticeship and applies them to thinking. How do you learn how to change the tire on your bike or cook a meal? Certainly you can read a book to learn how to do these things but traditionally you would learn by watching someone else do it, a master. A large percentage of our brains is devoted to vision so it's no surprise that people, in general, learn how to do something new by watching someone else who knows how to do it well. Cognitive apprenticeship is no different, except it is a cognitive or mental skill that is on display. In this case, the master or teacher makes his/her thinking *visible* when they work on a problem by talking it through out loud. In this way you are modeling to the student how you solve the problem.

Initially students might need a lot of modeling before they are able to do it on their own. You offer a lot of support at the beginning by giving them many hints and much feedback. As they gain confidence and mastery, you pull back on your direct support and allow them to work more and more independently. All the while the thinking is

being down out loud. Gradually the thinking will become internalized but not until the student gains the necessary experience and mastery of the concepts or problem-solving procedures. We call this in the educational literature, scaffolding.

### **Reflective Questioning, The Socratic Method**

You may be wondering how it is that the tutor gets the student to do most of the talking. Tutees come to tutoring with certain expectations and probably one of the big ones is that the tutor will teach and do most of the talking as well. The tutee will likely come to the tutoring session with a lot of questions. You will want to answer those questions but we are telling you to resist! Instead, ask questions back to the tutee. Rarely will you have to answer a question directly and rarely should you. When a tutee asks you a question, take that question apart and reflect a small portion of it back to the student. In this way you will also be scaffolding. In the same way most parents wouldn't just put their child on a bike at the top of a hill and push them down, you wouldn't let the tutee try to work on a difficult concept or problem all on their own. By breaking the concept or problem up into small parts and present them in question form, while also supplying hints and positive feedback, you will truly help that student become an independent learner. By doing this you will also be modeling how you, a successful student, tackles difficult problems.

### **Bloom's Taxonomy**

Although Bloom's Taxonomy has been around for a long time it is still critically relevant today. The taxonomy presents a hierarchy of thinking, complete with question descriptors, to help you generate appropriate questions to ask of your students. The types of questions you will want to ask your students will depend on where they sit in the hierarchy. However, your goal should be to try to move them along in the process so that they can make it a least the analysis level in order to successfully tackle course exams.

(See: [www.in2edu.com](http://www.in2edu.com), [www.nwlink.com](http://www.nwlink.com), Wikipedia or many other online sources for more information about Bloom).

## Bloom's Categories of the Cognitive Domain

BLOOM'S CATEGORIES	DESCRIPTION	DIRECTIVE WORDS	SAMPLE ACTIVITIES
EVALUATION	JUDGE THE VALUE BASED ON CLEAR EVIDENCE OR SELECT CRITERIA	ASSESS JUDGE EVALUATE MEASURE	CRITIQUE EACH OTHER'S ANSWERS.
SYNTHESIS	PUT TOGETHER PARTS, FORMING A NEW STRUCTURE OR PATTERN.	CREATE ORGANIZE ARRANGE PROPOSE	GENERATE PRACTICE QUESTIONS THAT INTEGRATE TEXT AND LECTURE CONTENT.
ANALYSIS	BREAK DOWN INFORMATION INTO PARTS	COMPARE/CONTRAST RELATE CATEGORIZE ANALYZE	CREATE A VENN DIAGRAM
APPLICATION	USE INFORMATION IN NEW WAYS.	PREDICT DEMONSTRATE SOLVE APPLY	CREATE A FLOW CHART SHOWING HOW TO USE A PRINCIPLE.
COMPREHENSION	ABLE TO GRASP MEANING.	EXPLAIN SIMPLIFY SUMMARIZE GIVE EXAMPLES	PARAPHRASE THE MAIN POINTS OF A READING ASSIGNMENT
KNOWLEDGE	RECALL OF INFORMATION.	RESTATE DESCRIBE DEFINE LIST	IDENTIFY THE STEPS IN A COMMON PROCEDURE.

From S.A. Lipsky (2011)

### Metacognition

What is metacognition? A basic definition of metacognition is thinking about thinking. It's knowing what you know and also knowing what you don't know. It includes the ability to make decisions about or to act on what you know or don't know. Metacognition is critical for true mastery of material. For example, am I ready for the exam on Friday? If you are using the cognitive apprenticeship approach by making your thinking visible to your students and by having them engage in self-explanation much of the time, you will also be getting them to think about their own thinking. The consequences of poor metacognition are clear. If we overestimate our knowledge we risk performing poorly because we think we are ready and won't continue to study. If indeed we are ready for that exam but don't know it we may lack confidence and perform poorly due to anxiety. Quite commonly we think we know something because it is familiar to us. We call this the illusion of knowing. The illusion of knowing is poor metacognition. Promoting metacognition in tutoring

sessions, then, is paramount to helping students become successful learners. What is the best way to do this? You got it, encouraging self-explanation and asking reflective questions.

### Questions to Consider

- Thinking back over your college career to date, how have you changed as a student since high school? Do you see yourself progressing up Bloom's Taxonomy in the work you do for your classes at Rochester? Discuss and give relevant examples.
- What is the difference between an instructor/teacher and a tutor?
- How will you model metacognitive behavior?
- How will you check for understanding during your tutoring sessions?
- Generate some effective facilitative questions (hint: think about Bloom's taxonomy).
- Generate a list of best practices for tutors. That is, what habits, beliefs and practices should all tutors share? What should they avoid?

### Recommended Readings:

John P. Cleveland (Dec. 19, 2008). *What Socrates Would Say to Undergraduate Tutors*, **The Chronicle of Higher Education**.

Collins (2002). *Cognitive Apprenticeship*. Chapter 4 from **The Cambridge Handbook of The Learning Series** edited by R.K. Sawyer, Cambridge University Press.

K.D. Tanner (2012). *Promoting Student Metacognition*. **CBE Life Sci Educ**. 11(4), 113-120.

William B. Wood & Kimberly D. Tanner (2012, Spring). *The Role of Lecturer as Tutor: Doing What Effective Tutors Do in a Large Lecture Class*. **CBE Life Sci Educ**. 11(1), 3-9.

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## *Collaborative Learning Strategies*

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### **Suggested Strategies**

**Asking questions** – This should be your main strategy. Not only should you ask general questions but also reflective questions as outlined in the Socratic Method.

*Think-Pair-Share or Pair Problem Solving* – Have your tutee try to solve or work through a problem while talking out loud about what they are doing and why. As the listener, the tutor just listens and interjects only to ask clarifying questions or to mention mishaps. If you are working with two students you can have one of the students be the problem-solver and the other be the listener. You, as the tutor, will also be a listener offering questions and noting mishaps if the student listening misses something.

**Mind-Mapping/Concept Maps** – For this activity, you ask the tutee to put information together in a sort of outline showing how the various pieces are connected. The Tutor puts a main topic in the middle of a piece of paper. Then, the tutee puts words that come to mind on sticky notes and attaches the notes to the paper connecting them in a way that makes sense. Through discussion, the tutee may rearrange the notes. This can also be done on a white board or on the computer. Several good concept mapping programs are available online.

**Model Building** - This can be useful especially in Chemistry but applicable in other disciplines as well. Tutors can borrow kits from their departments or make their own.

**Incomplete outlines** – For this, the tutor puts material together in an outline and then takes out some of the information for the student to fill in.

**Flowcharts** – These can be made during the tutoring session or used like the incomplete outlines strategy above.

*Writing to learn* – Have the student respond to a prompt out loud or on paper.

**One minute paper** - At the end of the session or at any time during, stop and ask the tutee to either say out loud or write down what they have learned so far.

**Student writes a problem** – have the student write a problem to work on during the tutoring session.

**Quizzing/testing** – A very effective way to learn is to take practice texts. Tutors can generate their own practice quiz or test or secure one from the instructor or TA. Tutors are encouraged to share materials with each other such as this.

**Practice problems** – The tutor makes up practice problems! Here too, we encourage you to share your problems.

**Debates** – post a question or issue and have students, if two or more, take a side. Case Studies – Find or write up a case study to use.

**Group problem solving** – present one problem to the tutees to work on together.

**Round robin** – if more than one tutee, go back and forth asking them each questions.

### **Helpful Resources**

Roth, V., Goldstein, E. and Marcus, G. (2001). **Peer-Led Team Learning: A Handbook for Team Leaders**, Upper Saddle River, NJ: Prentice Hall.

<http://www.cte.cornell.edu/teaching-ideas/engaging-students/collaborative-learning.html>

<http://www.gdrc.org/kmgmt/c-learn/methods.html>

<http://howtostudy.org/>

<http://www4.ncsu.edu/unity/lockers/users/f/felder/public/ILSdir/styles.htm>