

Good morning.

Let me read to you an actual exchange that was overheard between a professor and a student in his history class. ...

Perhaps we've had similar exchanges in our classrooms and wondered to ourselves, "What in the heck are our students thinking?!" I spent spring term asking just that - What are our students thinking?

### **Overhead**

Specifically, I reviewed the research on cognitive development in adulthood, by delving into the psychology literature as well as discussing that research with my colleagues throughout the country and locally.

In their great wisdom, the Faculty Professional Development committee has decided that you good people only have to listen to me ramble about what I've learned for 15 minutes. With that in mind, I'll spend a few minutes discussing some of the "levels" or "types" of thinking and then I'll talk about some ways that we can help to foster higher-level thinking in our students.

Certainly, with such a limited time frame, I'm sure you'll forgive my "glossing over" a few key points...

### **Levels of Cognitive Development**

Very briefly, the research literature talks about a number of "levels" or "stages" of cognitive development and suggests that we progress through them in a systematic and sequential way. I'd like to talk about them more as "types" than levels, and I'll explain why in a minute.

1. The first type of thinking, sensorimotor thinking, is exactly what it sounds like - young infants learn about their world exclusively through their senses and their motor skills, and through direct manipulation of objects in their environment.
2. When we talk about "operations" we mean logic or mental activities, so preoperational thinking refers to thinking without logic. We won't spend any time discussing this.

3. Concrete operational thinking refers to individuals being able to use logic to reason about things that are "concrete," that is, right in front of you or not abstract. Let's come back to this one.

4. Formal operational thinking refers to the kinds of thinking that occurs when one can reason logically about hypothetical or abstract concepts.

Let me give you a simplistic example to illustrate the difference between concrete and formal operational thinking. (Poison overhead.)

5. For years, the cognitive development research made the assumption that formal operational thinking (which researchers suggested you gain during adolescence) was the pinnacle of human thought, as good as it gets. To those of you who have a teenager in your household, I'm sure that's quite disconcerting. More recently though, researchers have talked about postformal operational thinking. Certainly it seems (in *some* cases anyhow) that our level of reasoning is more sophisticated than that of a 16-year-old.

### **Contrast formal and postformal**

Formal operational thinkers are like **budding scientists gone mad**. They make the (mistaken) assumption that because they can now use logic, everything *must* have a *single logical conclusion*. They see everything in terms of black & white, right & wrong, good & bad.

Postformal thinkers engage in relativistic thinking. They start to recognize that there are multiple viewpoints in the world about any given issue and that the "truth" depends on how the problem is viewed or defined.

They also start to understand that *they themselves* play a large role in not only how data is interpreted but how the problem is viewed. That is, rather than assuming (as brand new scientists do) that they can be completely objective, postformal thinkers realize that they can't be objective and so they figure their subjectivity into the equation. They use themselves as a reference.

Postformal thinkers also, rather than trying to divorce themselves from *emotion* recognize that emotion is an important part of their reality (and other people's realities). This is not to say that they try to infuse emotion

where it doesn't belong, but rather that they recognize when they are dealing with issues that are emotionally-laden for them, and again, they try to take that into account without either 1) pretending they aren't emotional beings or 2) apologizing for the fact they're emotional.

So, how **do** our students think??

The reality is, that most of us think in a variety of ways throughout the day. This is why I don't like to talk about these as "levels" or "stages" of cognitive development, but rather as "types" of thinking.

**[point to types overhead]**

Not all of our students are postformal thinkers (heck - we're not even postformal thinkers all of the time!). Many of our students who participate in formal operational thinking do so only in their areas of expertise (which may not be in our classrooms).

But it is a mistake to think that just because someone *looks like* a concrete operational thinker that they *cannot* think in other ways. I have a colleague who likes to talk about reaching postformal thought as having "a larger understanding, rather than reaching a higher level" of thinking.

And in fact, even those of us who claim to use postformal reasoning from time to time also use the other types of thinking I've described. **Can anyone think of a time, perhaps recently - if you're lucky!, that you've let your mind go blank and let your senses and your body do all of your "thinking" for you??** ... No one would suggest in that case that sensorimotor thinking is any less important a way of thinking, but it's quite different than applying logic and reasoning to the same situation.

### Applications

Given the assumption (which is a pretty big assumption on my part) that one role of higher education is to encourage postformal thinking, can we "teach" postformal thinking? If so, how would we do that?

Many textbook supplements & instructors manuals take the approach that if we include certain activities in our classrooms -- **such as allowing our**

**students to devise the grading criteria on the first day of class** - that we are encouraging higher levels of thinking. You've probably guessed (and the research literature bears out) that this is not necessarily the case.

Encouraging postformal thinking has less to do with a particular technique and more to do with what an individual instructor does with it. Certainly, giving an aggressive preschool child a sophisticated calculator does not encourage his math skills - he merely uses the tool as another type of "weapon."

With that in mind, what techniques might we apply in the classroom that may encourage postformal thinking?

1. One way to encourage postformal thought is an activity that comes from Native American tradition (as described by Paula Underwood in her research). The idea is to have students find 6 ways that effectively explain a given event. Alternatively, you could have students come up with 6 ways to solve a given problem, or have them look at a particular situation from 6 points of view. For example, when an environmental policy team looks at a land-use dilemma, one team member might ask how a given land use might affect wildlife while a second considers how it might affect developers...
2. Have students describe behavior from other viewpoints, particularly (but not exclusively) from the viewpoint of the person taking the action. For instance, show how an athlete who is anorexic (and even near death from it) might, on another level, be doing something useful psychologically.
3. Give students paradoxical instructions. For instance, ask them to write down 5 things in a classroom (or ice cream parlor or playground) that would *never* be worth studying.

Finally, it's important to keep in mind that these are all "types" of thinking, and that each of us - even those of us who are considered well-educated - use these different types of thinking at different times. It should never be our goal to "make" our students into postformal thinkers - that will come along for each person in his own time and his own way. What we *can* do is to 1) include more activities that encourage postformal thinking, 2) to model postformal thinking ourselves, and 3) to create an open atmosphere that

allows our students to take chances and "play with" different ways of thinking.

In conclusion, the student in the introduction *appears* to be using concrete operational thinking, but that doesn't mean that he's using that type of thinking exclusively or that it does no good for the instructor to encourage postformal thinking in his classroom.