

On Teaching Thinking Skills: A Conversation with B. Othanel Smith

Teaching should not be reduced to models. Instead, teachers need to understand the logic of their subject matter and should master a set of pedagogical skills to use as necessary.



In 1925, when B. O. Smith received his Bachelor of Science degree in Education from the University of Florida, he was a pioneer in a new field. Now a major architect of teacher education and evaluation, he draws upon his years of service at the Universities of Florida, Illinois, and South Florida to share his reflections on the most promising route to improvement of the teaching profession.

You've worked for years on a topic of current interest to educators: thinking skills. How did that come about?

Some of us who were working with public schools in the Chicago area in the 1950s thought that if we could teach teachers the logic of their subject matter, their students would understand the subjects better. We tried this for two years, but our efforts were largely unsuccessful, primarily because we approached the problem from the standpoint of informing teachers about logic rather than how to handle subject matter in a logical way.

Why the emphasis on logic?

My primary interest from the beginning has been in the logic of teaching. My doctoral study was on the logic of measurement. Dewey's logical studies attracted me in the '20s, and I discovered Piaget in the early '30s. In fact, in 1937-38 I prepared a book-length manuscript, never published, on the teaching of thinking. Well, I came back to that work in 1956 and did a study of classroom discourse to find out what teachers actually taught about the logical structure of knowledge.

What did you find?

That teachers use all the logical operations, if you treat them in a very general sense, that you find in the logic books. But teachers are unaware of using them because these operations are partly built into the language and partly into the structure of the content. For example, definitions are an important part of instruction—teachers simply cannot teach without defining terms—yet defining is often poorly done because teachers aren't acquainted with the nature of definitions.

What do they need to know?

Well, there are different kinds of definitions: classificatory definitions, operational definitions, stipulative definitions, and so on. Here's one difference. If you want to define "rain," you're in difficulty if you try to use any other than a stipulative definition. For example, if a corporation insures a ball game against rain, they can say, "If it rains a specified amount, it will be counted as rainy; but if it doesn't, it is not a rain and we won't pay." It's like defining a bald-headed man: how many hairs can a man have and still be

described as bald? Some definitions are open-ended like that, while others are not.

So teachers need to understand the basis for a definition before they can teach it to students?

To develop and teach clear concepts, teachers need to understand the nature of definitions. A definition, of course, is a verbal counterpart of a concept. When you have a clear verbal definition, and you understand the referent of that definition, then you know the concept.

That's just one aspect of the logic of teaching. Explanation is also a part of logic. Teachers are constantly involved in explaining, but there are different kinds of explaining. There's explaining in the narrative sense: to explain how Lincoln was assassinated, we use a narrative approach; we describe sequences of events. If you're trying to explain why an object floats, you use an approach that entails relations among variables.

Are you saying teachers need to understand this kind of complexity in order to do their jobs?

It depends. If we want students to understand the content in depth, yes. All of us have gone through school, and even though we may not have such understanding, we usually do fairly well, but the deeper we go in any field the more we come to understand what I have been talking about. The question is whether we want a larger portion of the population to get a fuller glimpse of the sort of understanding that the more highly educated get now.

Isn't that what some of the curriculum developers of the '60s were trying to do? Develop a better understanding of the essence of the various disciplines?

I think so, but they didn't get very far because they got hung up on models. Any time you try to reduce teaching to a model you're in trouble, because models give us formulas, and formulas squeeze the life out of teach-



ing. The highly effective teacher will design his or her own way of teaching.

I was brought up on models. When I was an undergraduate student, it was "the project method." Then there was the Morrisonian "unit method"; before either it was Herbart's model. Every teaching procedure that becomes formalized becomes deadening. We should teach teachers the skills of teaching—skills of working with children and skills of handling content—and then let the teacher put these skills together.

Is what you're saying related to the kind of teaching models that Bruce Joyce and Marsha Weil have written about?

Yes, although they have assembled a number of effective skills, and that is an important contribution.

But otherwise you reject that approach?

Yes. I reject reduction of teaching to any sort of formula.

Is what you're saying related to the work you did in the '50s and '60s that you mentioned earlier?

In a sense, yes. I found no consistent patterns in the performance of teachers in the best schools or even in the performance of the most highly successful teachers.

I believe you once thought of yourself as a humanist but don't like that terminology anymore. Is that correct?

I don't think I ever made a point of calling myself a humanist, although I have talked about humanistic behavior in the classroom. Anyway, what sort of humanism are we talking about? There is scientific humanism, classical humanism, and there's social humanism. So it's not clear what sort of humanism we're talking about.

What about humanistic education?

I prefer to reduce humanism to pedagogical skills.

What's an example of that?

Say that you're involved in working with a child and another child comes

up and asks you a question. You could say somewhat harshly to that child, "Go sit down; I'll get to you later." Or you could say to the child you're working with, "Why don't you go ahead with that part now," and then, speaking kindly to the other child, give some momentary help and say, "We'll do more on that later." That's what I would call a humanistic way of dealing with that situation.

Well, the one certainly sounds preferable to the other. But in what sense is that a skill?

I mean by skill a performance that you can modify according to circumstances. For example, talking to another person can be a skill. As I talk with another person, I can respond to what I'm saying in the same way as the other person responds. In fact, if I find myself saying something that may not be appropriate, I can rectify it immediately.

You may even interrupt yourself?

Yes. That's what I would call a skill: a physical performance. It's an act that I can respond to and modify.

That's a fairly behavioral way of looking at it, isn't it?

Yes, but it's cognitive as well. Whenever I start to say something, I can think about whether it's appropriate or not—that's a cognitive operation—and may change my direction. If an act is not under the control of a cognitive operation, it is sheer habit.

I want to ask you more about good teaching, but since we're talking about skills, let me ask you about the idea of teaching thinking skills. Is it defensible to refer to thinking as a set of skills that can be taught?

Yes, thinking can be a set of skills. It can come in many sets. It's a cognitive performance that has a physical manifestation in the way we handle information. A skillful thinker deals with data or information in ways not possible for the unskilled.

I am asking because I assume that skills can be improved with practice and coaching.

"Any time you try to reduce teaching to a model you're in trouble, because models give us formulas, and formulas squeeze the life out of teaching."



Yes. We improve thinking by practice. It is appropriate to talk about teaching thinking skills; that is, ways of collecting and organizing data in order to classify, explain, predict, test, and so on. As one performs these skills, he or she can become more flexible and thereby more effective as a thinker.

What do you mean by "flexible"?

Experimental work, some as far back as the '30s, shows good results when teachers convey to students, "Look, don't just approach it one way; if that doesn't work try another, and if that doesn't work try something else." If students do that, the possibility of their coming up with more fruitful answers is increased. Of course, there are many ways of increasing students' flexibility.

Is being flexible really a skill?

Well, if a child gets to the point where he or she routinely says, "I'm doing this, but I'll try to do that—and if that doesn't work, I'll try to do something else," I'd look on that as a skill. Some would call it a disposition, and I wouldn't quarrel about that. Pedagogically it probably makes no difference.

What are some other teacher behaviors we should be encouraging if we want students to be better thinkers?

Let me discuss the question in this way. As a teacher, I may say, "Here are some problems I want you to solve." Now, what do I mean? I really mean that I am giving them problems that I have illustrated how to do. There are rules—procedural rules—for working

them. There are givens in the problem, and there are definite answers. That's what we mean, at least in school, by "problems." Psychologists now regard that sort of problem as "well-structured." We need to teach children to work such problems, but a lot of problems are unstructured: we don't know what the givens are, and we don't know whether there's a definite answer or not.

A good many of the situations we encounter in real life are like that.

- They require an unstructured approach. They're comparable to what Dewey called "perplexing situations." These problems require skills different from those needed to solve well-structured problems.

- Structured problems are more content specific. You can find illustrations of how to proceed with some of them in mathematics books. When it comes to unstructured problems, we are somewhat less certain about what to do. We can teach about experimentation: how to control variables, about correlation, about proportionality. These entail fundamental skills of thinking and should be mastered by teachers as well as by students. In addition, there are simple devices, like scatter diagrams, that can help show relationships among variables.

You seem to be saying, though, that we must depend on teachers to get this kind of information to students—that this is a matter of building teacher knowledge and skill, and not just of designing better curriculum materials.

That is correct. Student learning materials alone will not suffice. In ill-structured problems such materials can be a hindrance. The teacher must perform the skills of handling the content at high levels of thinking, at the intellectual level expected of the student. That sort of teacher performance is more important than anything else in the process of teaching students to think more skillfully.

"The effective teacher is one for whom the valid skills of teaching and student management are second nature."

But you do want to provide more complete knowledge to teachers about what these mental processes are, don't you?

Not exactly. Teachers do not work with mental processes, but with knowledge and materials. We can name these processes, at least some of them, such as perceiving and judging, but we know very little about them. Our access to them is through materials and teacher performance. It cannot be overemphasized that the teaching of thinking does not take place by working directly with mental processes. It is the way teachers work with the content of instruction that affects the way students learn to think effectively.

In recent years you've been a strong advocate of use of the teaching effectiveness research. Is that the reason?

Yes. The prospective teacher has a very brief time to prepare for a tremendously complex task—more complex than any other profession. I want that teacher to get the skills and knowledge that we know constitute effective teaching, at all levels of thinking, and to the point that he or she can use them in the classroom as automatically as possible. To the extent they are automatic, he or she can give attention to other things. The effective teacher is one for whom the valid skills of teaching and student management are second nature.

Some say the kinds of behaviors that have been identified by the teaching effectiveness research are too narrow; that they only take us so far and no further; that, in fact, some of the things we want as teaching for thinking are contrary to behaviors that have been found to be associated with high-test scores.

Part of what you say is a truism: we never have complete knowledge; we're always wanting more, and rightly so. But the idea that effective skills of teaching are in conflict with teaching people to think has yet to be demonstrated. No, I don't see any incompatibility.

Schooling is short, and the amount of dependable knowledge we have about teaching is very limited. Anything that diverts that knowledge—that replaces valid pedagogical principles, concepts, and skills that teachers desperately need to handle knowledge successfully at any intellectual level—comes at a high cost. □

Reference

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B. Othanel Smith is Professor of Education Emeritus, living at 854 Island Way, Clearwater, FL 33515. **Ron Brandt** is ASCD's Executive Editor.

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