TEACHING FOR DEEP UNDERSTANDING

What Every Educator Should Know

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2

Reflections on Depth

Carl Bereiter

For Carl Bereiter, deep understanding means understanding deep things about subjects worthy of our students' attention. In this chapter, he sets the direction and tone for the chapters that follow.

1. How can teachers help students acquire a disposition for depth?
2. How can teachers identify deep things worthy of students' understanding?
3. How can teachers ensure students have intimate contact with those deep things?
4. How can elementary teachers, often responsible for all areas of the curriculum, develop a deep understanding within many disciplines?

Everyone is in favor of depth. We use the term with confidence, even though we cannot define it, and evaluating it is highly subjective. We speak of depth of understanding and depth of feeling. A book or an art work may be deep, and so may be our appreciation of it. In-depth analyses are always on offer. There can be depth of learning in any content area, any complex skill. There is depth in the treatment of concepts, issues, problems, and interpretations. In short, virtually all the more elevated educational objectives can be cast in terms of depth. Having so much educational weight resting on an undefined concept must give us pause, however.

The reason *depth* is so hard to define is that it has meaning only with respect to something specific. You cannot define depth in general terms, the way you can define honesty or fairness. Nevertheless, there may be general principles of teaching for depth. For one thing, it seems essential that students themselves value depth and pursue it through their individual and collective initiative. Although some degree of understanding can come about just through exposure, there is ample evidence from many different domains that difficult things are understood only with effort. The biologist E. O. Wilson said, "Natural selection built the brain to survive in the world and only incidentally to understand it at a depth greater than is necessary to survive" (1988, p. 61). In other words, the pursuit of deep understanding is not something that comes naturally as an expression of normal curiosity. It is an acquired disposition. Possibly deep appreciation can come about naturally in some cases; but educating people's sensibilities would seem to require getting them to pay attention to things they ordinarily overlook. And the right kind of attention probably requires a student who is trying to perceive more deeply.

DEPTH OF UNDERSTANDING

The two most common conceptions of understanding are one I call the *correspondence conception* and one that its advocates call the *performance perspective.* The correspondence conception has been most clearly set forth by Nickerson (1985) "One understands a concept (principle, process, or whatever) to the extent that what is in one's head regarding that concept corresponds to what is in the head of an expert in the relevant field" (p. 222).

The performance perspective, as advanced by David Perkins and his colleagues in Harvard's Project Zero, defines understanding as consisting of the performance capabilities and dispositions that would lead us to credit a person with understanding: ability to explain, to apply, to evaluate, and so on.

What would depth of understanding consist of in these two views? According to the correspondence view, deeper understanding would presumably consist of a closer match to the expert's knowledge. Depth, accordingly, is not an endless continuum but reaches its limit in a perfect match between what is in the head of the student and what is in the head of the designated expert. According to the performance perspective, depth would presumably be gauged by the quality of the performances. However, McTighe and Wiggins (1999) remind us that quality of performance can be influenced by a number of variables, only one of which is understanding. Thus evaluating depth of understanding requires inferences beyond the observed performance, and it is not clear how those inferences are to be made.

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My own definition of depth of understanding is the following: Deep understanding means understanding deep things about the object in question.

When I offer this definition, people tend to shrug or snicker, for the definition sounds circular, avoiding an actual coming to grips with the meaning of depth. But the definition is not circular. Identifying the deep ideas in a discipline, the deeper meaning of a poem or story, the underlying causes of a historical event or a social condition, the deeper issues in a controversy—these are lively concerns of scholars and critics, curriculum committees, and professional associations. In any significant

area, educators can get plenty of help in identifying the deep things worthy of students' attention and understanding. Teaching for depth means bringing students into intimate contact with those deep things.

Of course, what the deep things are may often be in dispute, and there is change over time. The deep things that scientists would agree need to be understood about genetics or the brain are quite different today from what they were 40 years ago. Every major literary work provokes different interpretations that point to different things to be experienced and understood. But these are signs of healthy disciplines. They should not deter us from doing the best we can to help students get to the depths of whatever they are studying.

DEPTH VERSUS BREADTH

Depth has two opposites: superficiality and breadth. Breadth is generally considered to be good and superficiality bad, yet educators know they go together. The realities of time and resources ensure that breadth is usually attained at the cost of superficiality. The survey course—Something-or-other 101—dramatizes the problem. If you get a group of experts in any field together to determine what is essential knowledge for a beginner, they will quickly generate a list too long to cover in any depth. To trim the list would be to imply that some of the scholars had been wasting their careers on matters of limited importance. And so superficiality is the inevitable consequence of too much to learn in the time available.

But there is value in wide-ranging superficial knowledge. The most comprehensive defense of this proposition is to be found in E. D. Hirsch's *Cultural Literacy* (1987). Anyone who is inclined to wax censorious about breadth should read with as open a mind as possible the first two chapters of that book. The part of the argument that connects breadth to depth shows that marginal understanding of a wide range of terms and facts, although of little value in itself, is essential for understanding the kinds of texts—books and quality magazines and newspapers—that do promote depth of understanding. Knowledge of this superficial kind is, curiously, called literacy—as in scientific literacy, historical literacy, and the like. Literacy, in this sense, does just mean a middling level of knowledge, sufficient for the intellectual needs of the educated nonspecialist. In advocating such literacies, we should keep in mind that we are in fact advocating breadth and tolerating superficiality.

Finally, it remains to be said that in some areas, most notably history, depth is impossible without breadth. Deep understanding of any particular topic in history—for instance, the French Revolution—requires understanding its broader contemporary context and also its relation to similar events—other revolutions—that may be distant from it in time and place. In general, we may say that the problems of depth/breadth become more acute the more saturated the field is with factual information. Thus, breadth is more important in history and social studies than it is in science, where a better case can be made for reducing breadth in the interests of depth.

IMPLICATIONS FOR TEACHING

Teaching for Depth = Internalization

This happens when . . .

- We encounter a powerful idea
- We read a powerful book
- We hear a powerful piece of music

Teachers need to find ways to make this happen more often and in more powerful ways–starting by making contact with the deepest wellsprings of the learner's thought and feeling.

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Uneasy compromise is the most available way of dealing with the competing demands of depth and breadth. In *How People Learn*, Bransford, Brown, and Cocking (2000) come out strongly for depth but then start to waffle:

> Superficial coverage of all topics in a subject area must be replaced with in-depth coverage of fewer topics that allows key concepts in that discipline to be understood. The goal of coverage need not be abandoned entirely, of course. But there must be a sufficient number of cases of in-depth study to allow students to grasp the defining concepts in specific domains within a discipline.

Well-earned fame should await anyone who finds a coherent way of achieving breadth and depth through the same knowledge-seeking process, a way that does not relegate them to separate compartments of the educational program.

HIGHER ORDER THINKING SKILLS

Despite a certain semantic awkwardness about rising higher to go deeper, many educators feel comfortable equating higher order thinking with depth. Manifestly, deep understanding requires thinking of a high order. But it does not follow that the two kinds of educational objectives are interchangeable. Activities aimed at developing higher order thinking skills (HOTS) are typically of short duration, high in process, but short on content. The main emphases are on idea generation (e.g., brainstorming, lateral thinking) and critical analysis (e.g., logical inference, argumentation and debate, recognition of propaganda). Because there are many HOTS and many areas in which they may be applied, coverage tends to be superficial. Thus, although the objectives of HOTS are consistent with those of depth, the methods typically employed for pursuing them are antithetical. My own belief is that HOTS, multiple intelligences, and the like should be kept in mind in educational planning but should not be constituents of the curriculum (Bereiter, 2002, Chapter 10). Eliminating them will strike a blow for coherence and will free up precious time for the pursuit of depth.

Real Depth

Depth should not be confused with advanced study. An advanced course in physics may be just as superficial as a beginning course: It merely covers more advanced material. Advocates of scientific literacy and other such literacies are correct that nonspecialists do not need advanced courses, but this should not be taken to mean that they do not need greater depth of understanding. After students have learned the layout of the solar system and the movements of the planets; after they have overcome such misconceptions as that up and down are absolute directions and that seasonal change has to do with the distance of the Earth from the sun; after they have delivered all the relevant understanding

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performances of explaining, interpreting, and applying—what else is there if not more advanced study of astronomy?

In a word, what lies beyond is *internalization*. At the deepest levels, understanding of an important theory or work of art should change the way we perceive and experience the world. It should become part of our personality rather than only something we can bring to mind in appropriate contexts. If we have really internalized the Copernican model of the cosmos, then we should perceive the landscape visible out the window as part of a globe; we should not have to remind ourselves that that is what it is. (This does not preclude our dealing with it as a flat surface or whatever most of the time.) If we have really internalized Shakespeare, it should change the way we respond to expressive language of all kinds.

When applied to problems of understanding, idea improvement entails going deeper, using all the knowledge resources available.

Even the most in-depth of school studies tends to stop well short of internalization. The result is knowledge that may not be inert; it can serve practical and cognitive needs and provide a basis for further learning. But it does not in any fundamental way alter our outlook on the world. It does not make us better people. Every once in a while, something does break through. We encounter a powerful idea or read a powerful book or hear a powerful piece of music that changes us, that radiates through our whole person. Education for depth would find ways to make that happen more often and in more positive ways. Needless to say, such education would not be imposed on the learner. It would make contact with the deepest wellsprings of the learner's thought and feeling; natural processes would take it from there.

IMPLICATIONS FOR TEACHER EDUCATION

Teaching for depth presents a challenge for teacher education. All might agree that student teachers need to experience depth themselves if they are going to teach for it, but what should that amount to in practice? Regarding teacher education courses themselves, arguments for depth far outweigh arguments for breadth. There is very little indispensable content, although outside agencies may be imposing excessive coverage requirements, just as they do with the school curriculum. At the same time, there are big and often difficult ideas in education. Dewey's concept of experience and such modern concepts as self-organization are examples. These tend to be ignored or watered down in education textbooks on the apparent assumption that student teachers are ill disposed to wrestling with difficult ideas. However, if we are at all serious about promoting depth in school learning, we ought to have some confidence that teachers are capable of depth in their professional preparation.

In addition, a case can be made for depth of learning in the subjects future teachers will teach. What this entails has been well formulated by Bransford et al. (2000):

> Teachers must come to teaching with the experience of in-depth study of the subject area themselves. Before a teacher can develop powerful pedagogical tools, he or she must be familiar with the progress of inquiry and the terms of discourse in the discipline, as well as understand the relationship between information and the concepts that help organize that information in the

> discipline. But equally important, the teacher must have a grasp of the growth and development of students' thinking about these concepts. The latter will be essential to developing teaching expertise, but not expertise in the discipline. It may therefore require courses, or course supplements, that are designed specifically for teachers. (p. 20)

The distinction I discussed earlier between depth and advanced courses is important here. Generally, university departments provide opportunities for more advanced courses but not deeper inquiry into basic subject matter. Accordingly, the result of requiring future teachers to gain better preparation in content areas is that they take courses dealing with content they will never teach. Courses going more deeply into such school subjects as arithmetic, the topics actually treated in school science and social studies, and the literary works actually studied in schools would meet an urgent need. In many universities, the number of teacher education students is large enough to justify such special courses (which would also be of value to other students seeking literacy in a field). It would also be a way of extending teacher education without adding time to the teacher education program per se.

Whether it is done in teacher education courses or in the going-deeper subject-matter courses discussed above, students ought to gain experience in the kinds of activity that actually produce depth. I have not elaborated on this matter here because it is a large and complex topic in its own right. The key, I believe, is knowledge building, understood as a social activity whose object is the creation and improvement of new knowledge and the solution of knowledge problems (Bereiter, 2002; Scardamalia, 2002). One of its cardinal principles, the one that most sharply distinguishes it from other constructivist approaches, is idea improvement. When applied to problems of understanding, idea improvement entails going deeper, using all the knowledge resources available. In a knowledge-building context, it also entails epistemic agency—personal and collective responsibility for advancing the state of knowledge in the community.

Yet the pursuit of depth is—how else can we put it?—deeply rewarding.

Depth, we would all agree, cannot be imposed from the outside. But it also cannot be depended on to emerge naturally from ordinary activity, scholastic or otherwise. Yet the pursuit of depth is—how else can we put it?—deeply rewarding. One way or another, future teachers must experience its rewards and acquire a well-grounded faith that those rewards can be made available to their students.