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### Chapter

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## Theory Building and the Pursuit of Understanding in History, Social Studies, and Literature

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### Abstract

Although learning with understanding has been recognized as essential to quality learning across the curriculum, it has been less extensively studied in the humanities and social studies than in the natural sciences. This chapter examines differences in what constitutes understanding in history, social studies, and literature, but also elaborates on one commonality: the role of theory building. At the school level, theory building in these areas focuses not so much on general theories as on what are called “theories of the case”: theories that explain particular events, conditions, literary works, and so on. Yet these limited theories can be expected to meet not only the same requirements of explanatory coherence as scientific theories, but also additional requirements such as those of narrative or emotional coherence. “Knowledge building” is described as an approach to quality learning of conceptual content in which depth of understanding is achieved through creating and improving explanatory theories.

Whatever other characteristics may determine quality of learning, depth of understanding is surely a major one and beyond dispute. But depth falls into that category of things people feel confident they can recognize yet find it impossible to define. In *Teaching for Deep Understanding* (Leithwood et al., 2006), a number of educators – ourselves included – address teaching for understanding in various subjects and contexts. Although when speaking in generalities, the authors appear to use the word “understanding” in the same way, when they get down to particulars, it becomes evident that “learning with understanding” means different things and presents different problems in different areas of the curriculum.

What do understanding the period of a pendulum, understanding mercantilism, and understanding *Alice in Wonderland* have in common? We might

agree that they all involve ability to explain, but that only pushes the problem back a step. What do explanations in physics, history, and literature have in common? From one viewpoint, they are very different. In this chapter we will consider some of those differences, but we also argue that they do have something important in common. They are all theories. They are different kinds of theories, but viewing the pursuit of deep understanding as theory building gives it a certain coherence that can be of practical value in planning for high-quality learning and that is missing from generalities about teaching for understanding. Treating the pursuit of understanding as a form of theory building is an especially productive way of regarding it if understanding is to be pursued by means of student-conducted inquiry. As junior theoreticians, students need to have some idea of what kind of theory they are building, and teachers need to be aware of this as well, in order to provide guidance. Conceiving of learning with understanding as theory development is also relevant to more direct kinds of instruction if one heeds philosopher Karl Popper's assertion that "we can grasp a theory only by trying to reinvent it or to reconstruct it, and by trying out, with the help of our imagination, all the consequences of the theory which seem to us to be interesting and important" (in Popper & Eccles, 1977, p. 461).

The profound differences among scholarly disciplines that Jerome Kagan wrote about in *The Three Cultures: Natural Sciences, Social Sciences, and the Humanities in the 21st Century* (2009) are only dimly reflected at the school level. From what we have seen of curriculum standards and textbooks, literary theory has hardly any presence in literature teaching, and sociological, psychological, and economic theories are touched on only lightly, if at all. And of course, mathematics beyond elementary algebra finds hardly any place outside mathematics classes. Nevertheless, there are important differences between school subjects in what counts as theoretical or explanation-seeking inquiry. Authentic inquiry in the natural sciences pursues big ideas that explain large classes of phenomena (Bybee, 2002). For students of history, social studies, and literature, authentic inquiry typically means building theories that explain particular cases – particular events, conditions, literary works, and so forth – rather than explaining large classes of phenomena. This chapter examines kinds of theory building appropriate to inquiry learning in these fields. The distinctive characteristics of knowledge in these fields warrant special attention, because the extensive educational literature on approaches to learning through inquiry is largely focused on science – project-based science (Marx, Blumenfeld, Krajcik, & Soloway, 1997), guided discovery of scientific facts and principles (Carin, 1992), applications of knowledge building to science learning (Messina & Reeve, 2006), and so on. Moreover, extensions of inquiry learning

beyond science tend to be modeled on scientific inquiry. Even on casual reflection, however, it is evident that literary knowledge, for instance, is very different from scientific knowledge. Less evident, but vitally important for educational design, is the extent to which historical knowledge and knowledge in social studies are similar yet different from both natural science and each other.

### The Concept of “Theory of the Case”

According to a National Academy of Sciences committee (National Academy of Sciences and Institute of Medicine, 2008, p. 11), a scientific theory is “a comprehensive explanation of some aspect of nature.” Although the term “aspect of nature” is undefined, it clearly refers to something more than a singular case or event. Indeed, the larger the class of phenomena explained, the better, as exemplified by continuing efforts to expand the boundaries of what evolutionary theory explains. However, in history, literature, and many parts of social studies, explanations or interpretations of particular cases are of central importance, and so it is a matter of some consequence to what extent such explanations and interpretations are theories and subject to the same conditions that constrain scientific theories. Accordingly, we discuss theories of particular cases and consider the extent to which they are similar to theories that explain some “aspect of nature.”

The term “theory of the case” appears most often in jurisprudence (cf. Burns, 1999). In a criminal trial, the prosecution cannot merely present a variety of facts that suggest guilt; the prosecution’s *case* is in effect a theory intended to account coherently for the evidence in such a way as to make guilt of the defendant a necessary conclusion (Byrne, 1995). The judge or jury must decide whether the theory is true. The defense does not normally need to propose an alternative theory. Under the principle of “innocent until proved guilty,” the defense only needs to cast doubt on the prosecution’s theory – usually, as in scientific debate, by questioning the prosecution’s evidence and by pointing to evidence inconsistent with the prosecution’s theory. A convincing alternative theory, however, makes for an even stronger defense (Thagard, 2003). A good theory of a case should be able to coherently explain all the facts of a particular case, but it is not obliged to explain facts that lie outside the case. Similarly, a medical diagnosis is a theory that explains the symptoms of a particular patient.

Working in the tradition of “inference to the best explanation,” Thagard (2000) developed a model of “explanatory coherence” and implemented it in a connectionist computer program. Initially applied to scientific explanation, the same model proved applicable to jurisprudence, medical and

psychological diagnosis, and in fact any process of rational, evidence-based explanation. Accordingly, within Thagard's model, general theories purporting to explain some "aspect of nature" and theories of particular cases are equally subject to requirements of explanatory coherence (and can be modeled using the same computer program). Briefly, these requirements are that a theory be consistent internally, consistent with provisionally accepted facts, and not generative of false predictions. Other things being equal, the most parsimonious explanation is selected as "best." Although there is dispute about the extent to which coherence criteria are necessary or sufficient (Lehrer, 2000, pp. 97–122), there is no question that they mark desirable attributes of a theory. In the present discussion, we take it as settled that pursuit of explanatory coherence is genuine theory building, regardless of the domain or scope of the theories and regardless of additional criteria relevant to explanation in certain domains. Explanatory coherence applies to explanations in all kinds of social situations (Read & Marcus-Newhall, 1993). Arguably, theories of particular cases play more significant roles in most people's mental lives than do theories of general cases (the kind represented in the sciences).

#### **History: Theories without Laws**

During the nineteenth and early twentieth centuries, there were many efforts to formulate laws of history, comparable to scientific laws. Hempel (1942) defended this effort on the basis of a positivist epistemology. The modern consensus among professional historians, however, seems to be that no such laws are tenable (Carneiro, 2000, pp. 199–232). There can be empirical generalizations, such as "All civilizations eventually collapse," but this is nothing like Newton's second law of thermodynamics. Jared Diamond (2005) identified eight factors that account for the collapse of past civilizations, but he allowed that four new factors might contribute to future collapses. And this does not exclude the possibility that the next civilization to go under may do so for an unforeseen reason, or that some civilization might survive the conditions that have made other civilizations collapse.

Historical events are unique and unpredictable in ways that matter historically, but this does not mean they are inexplicable. The more common problem is too many explanations. Some 210 explanations of the fall of Rome were catalogued by Alexander Demandt (cited in Bowersock, 1996). Good historical explanations are theories in the sense that they are testable by evidence, they imply facts not already known, and they share inferential relations with other explanations. However, they are theories of particular cases, as discussed in the preceding section. The particular case may be an

event, epoch, movement, or person, or it may be a change or a difference (for instance, the rise of democracy or a comparison of the French and the Bolshevik revolutions), but a theory of the case is not a universal trend or class of events – not an “aspect of nature” or of the human past.

A history, however, does not only offer explanations; it also commonly tells a story; and the explanation is often implicit in the story rather than standing apart. The story must have its own kind of coherence. A nonfiction narrative must be logically consistent and cohere with facts; in this regard it is functionally equivalent to a theory (Byrne, 1995). But it must also cohere internally in the manner of a well-formed story: It will have a plot, and motives will play a necessary part in it. Thus it has literary qualities that make the past come alive for contemporary readers of a certain background. Through these qualities, according to Ricoeur (1988, p. 185), “We learn to see a given series of events *as* tragic, *as* comic, and so on.” As Walsh (1958, p. 98) observed, “each generation finds it necessary to rewrite the histories written by its predecessors.” This is not only because new facts arise, but also because a new generation will attach different importance to certain facts and will require a different narrative treatment to find themselves in the story and to *care* about the people and their actions. That history textbooks can fail on this account is suggested by evidence that inner-city high school students, even high-achieving ones, find the history of their country pointless and of no value (Price, 1998), and that revising texts to include more about motives improves learning (Beck, McKeown, Sinatra, & Loxterman, 1991).

In recent times, the paradigm for inquiry learning in history has students doing research on local history, using primary sources. Like “guided discovery” in science, it is a way of acquainting students with basic tools and procedures of the craft. The intellectual quality of the experience may be boosted by confronting students with challenging problems and ensuring that the higher purposes of the disciplines are not lost. These higher purposes have to do with rendering the natural world and the human past increasingly comprehensible. In science, this means producing increasingly powerful and coherent explanations – theory-building, in short. In history it means the same, with the added challenge of conveying the theory through a compelling narrative. This is a tall order, but there is no reason to suppose school students cannot at least give it a good try. In general, it seems getting the cart before the horse to engage students in use of the tools and methods of a discipline before they have done any of the questioning or theorizing that would create a context in which those tools and methods serve the students’ needs. Yet both teaching “the scientific method” and teaching techniques of historical research are susceptible to this misdirection.

Why study history at all? The stock answer is that it helps in making wise decisions about current affairs. Every public crisis brings on a search for historical parallels and stimulates arguments among pundits about the validity of various comparisons. Similar arguments are also often encouraged in classrooms, where they represent a way of making history “relevant.” We do not question the value of this as an approach to current issues, but it has serious limitations because of the students’ inevitable deficiencies in historical knowledge. Their repertoire of potentially relevant cases is necessarily small, and typically they will not understand the cases at a deep or abstract enough level to enable them to evaluate parallels critically. As a result, they are largely dependent on received ideas – received from teachers and parents or from Internet bloggers and media personalities. This does not obviate productive argument, of course (most arguments among adults are similarly constrained to received ideas), but it does mean that a lot of history learning is needed before students are in a position to make creative uses of the past. This implies a need for both breadth and depth in history learning. Theory building can lead to greater depth, through engaging students in pursuit of explanatory and narrative coherence. Contemporary approaches to improving the quality of history learning, such as the use of multiple sources offering multiple perspectives (Rouet et al., 1996; see also the chapter by Britt & Rouet in this volume), fit nicely within a theory-building approach. The challenge of breadth may require other approaches that entail some sacrificing of depth in the interest of expanding the repertoire of cases. But even a historical movie, for instance, although it may provide little depth, may nevertheless raise historical questions that students can address through theory building. History education committed to depth of understanding may be superior to education that focuses on historical facts, but high-quality education must aim for both breadth and depth of historical knowledge if it is to equip students to make wise decisions about current affairs.

### **Social Studies**

Social studies cover a very wide range, from the kindergarten study of “community helpers” to high school courses that delve into economics, political science, and sociology. Although history is often included as part of social studies, we omit it here because it has been discussed separately in the preceding section. A common feature of social studies is that there are lots and lots of facts, not very closely tied together, and therefore difficult and frequently boring to learn. Among the devices that have been used to enliven these subjects are field trips and movies, games (especially simulation games), and debates

and discussions of controversial issues. None of these activities, however, represent inquiry per se, even though they may play a part in inquiry.

Practitioners of the disciplines comprising the social sciences are interested in explanation, just as natural scientists and historians are. However, social explanation is different from historical explanation, although both produce theories of individual cases. There are also general theories in the social sciences, but at the school level these are rarely studied.

An interesting contrast has been drawn between social and historical explanation. As an example of social explanation, R. W. Miller (1994) has used explaining the switch from carbon steel to stainless steel in knife manufacturing. It is sufficient, Miller argued, to identify the known advantages of stainless over carbon steel and relate these to the economics of the knife industry. The question for the social scientist is “Why would this have happened anyway, even in the absence of the individual causes leading up to it?” (Miller, 1994, p. 475). By contrast, historians, according to Roberts (1995, p. 133), seek to find out “Who was the author of an event, what were his or her purposes, and why did he or she have those purposes?” Although these commentators may have exaggerated the contrast between social and historical explanation, they have usefully pointed out two directions for theory building to account for social facts: one looking for causal conditions and the other looking for the motivations of the actors involved. There is also an interesting line of inquiry that combines the historical and the social: How important were the individual actors in bringing about an event or change? Would aviation be any different if the Wright Brothers had never lived? (Most likely not.) Would the Russian Revolution have taken place without Lenin? (A good question; and, minus Lenin, would it have been a Communist revolution?) Answers to such questions will call for theories of the particular case, but ones that draw on social concepts as well as historical facts.

Controversial social issues provide an important but difficult focus for student inquiry. Should genetically modified foods be allowed? What can we do to reduce greenhouse gases? Should the habitat of the snowy owl be protected? There are problems of understanding lurking behind all such questions, but reading material presenting different sides of the argument and debating and interpreting evidence and answers to questions do not reliably lead to them (Porat, 2004). The questions are much more likely to provoke calls for action, clashes of beliefs, and influence from and solidifying of original positions than constructive inquiry (McKenzie, Lee, & Chen, 2002; Petty, Briñol, & Tormala, 2002). When a controversial issue is introduced, students’ prior beliefs are bound to come forth, especially the more dogmatic or passionate ones. The challenge is not to suppress these, but to raise the discussion



to a higher level rather than allowing it to deteriorate into insults and diatribe, as many commentaries on blogs and news sites do. There have been successful attempts to advance student understanding through argumentation (Kuhn, Shaw, & Felton, 1997; Miller, 1987), but little attention to enlisting students themselves in elevating the level of discussion. Bringing students into the challenge would seem to be a most desirable course, with substantial advantages to quality of learning.

Ideally, a discussion of social issues will rise to the point where it can focus on what students recognize they do not understand. Is there anything you don't understand about global warming – anything that doesn't make sense? Not, "Is it fair that some people make more money in a year than most people earn in their lifetime?" but "What is causing the income gap to get wider?" or, at an even more basic level, "What determines how much people get paid for their work?" Assuming that even on the most hotly debated issues there are some people somewhere who are trying to understand the problem, it would be helpful if students could be exposed to these discussions and, if possible, drawn into them.

As with natural science and history, it would seem that the object of inquiry in the social studies should be explaining facts that the students themselves feel are in need of explanation. There ought to be many such facts: for instance, facts about poverty, wealth, and inequality; facts about crime and corruption, wars and revolution, political beliefs and extremism, taxation and public services, profit and finance, and so on across the whole spectrum of social conditions and phenomena that constitute the most important aspects of the world in which students will live their adult lives. Yet research over four decades has shown a common tendency for students to find social studies boring and unrelated to their needs (e.g., Chiaddo & Byford, 2004; Moroz, 1995; Schug, Todd, & Berry, 1984).

One factor that we speculate plays a role in students' lack of interest in social studies is the relative weakness of the cognitive rewards for inquiry compared to those in the natural sciences. Whereas successful inquiry in the natural sciences can yield "a-ha!" experiences, accompanied by a feeling of "Now I get it," in the social sciences, we speculate, advances in understanding come not so much as flashes of insight as increments of perceived complexity. Intellectual "a-ha!" experiences generally come from what Koestler (1964) called "bisociation" – the joining of previously unrelated information or ideas. For Darwin, and for students following his thought, it was the joining together of facts about stock breeding with facts about species adaptations. For Newton, it was the joining together of facts about gravity on earth and facts about the orbits of planets. These are examples

of radical but scientifically justified simplification. The “big ideas” in science generally have this character (if they do not, there is reason to question their “bigness”). When students grasp them, an “a-ha!” experience is to be expected. The social sciences contain intriguing “big ideas” (for instance, the concept of a market in economics and the concept of emergent structure in social psychology). In elementary school, however, the “big ideas” are likely to be things like diversity and interdependence. Important as such ideas may be, they seem unlikely to produce a shock of recognition. In fact, some of the “big ideas” to be found in curriculum guidelines and plans on the Web – concepts such as community, globalization, and transportation – are more like topic headings than ideas with explanatory power. On balance, it seems that at the school level, striving for bisociative “big ideas” is a less promising objective than raising the level of complexity with which students approach social issues.

How can the social studies be revised to accommodate both the interests of learners and the social needs that are the reason for teaching social studies in the first place? The standard consensual method, which has practitioners and subject-matter experts putting their heads together and deciding what students need to learn, does not seem to have worked very well in the social studies domain. An alternative is “knowledge building” (Scardamalia & Bereiter, 2006). In knowledge building, the principal work of students is producing new knowledge of value to their community. A cardinal principle is “real ideas, authentic problems” (Scardamalia, 2002). “Authentic problems” are questions that both the students themselves and disciplinary experts recognize as worthy of inquiry. Research on children’s questions indicated that when students asked questions they really wondered about, there was a strong tendency for experts to recognize these as significant questions (Scardamalia & Bereiter, 1992). The reconciliation of student interests and disciplinary concerns seems to take care of itself, provided the situation is one in which students feel free to express their genuine puzzlements without fear that asking a question entails an obligation to find an answer to it. Pursuing explanations in a progressive but not overly constrained way is what we have been referring to as “theory building” – a practice central to knowledge building in formal education. Knowledge building may not be the only way to bring into the social studies content that students will want to “own,” but it does seem to offer more promise for high-quality learning than approaches that take content as given and experiment only with methods of acquisition. According to Tsoukas (2009), knowledge-creating dialogue produces “self-distanciation” – a more detached perspective on one’s own ideas that makes it possible to view them in relation to other ideas and thence to draw new distinctions, which

Tsoukas, an organization scientist, considers to be an essential step in the production of new knowledge.

Alongside the need to master important concepts from social science is the growing need for understanding diverse world cultures. *New York Times* columnist Roger Cohen (2008) summed up the world cultural situation as follows: “The main forces in the world today are the modernizing, barrier-breaking sweep of globalization and the tribal reaction to it, which lies in the assertion of religious, national, linguistic, racial or ethnic identity against the unifying technological tide.” The need to understand both the world situation and the different cultural groups to which people link their identities is becoming increasingly urgent, and the schools’ traditional way of dealing with world cultures is becoming increasingly inadequate, if not detrimental. The oft-ridiculed traditional way concentrates on dress, folk dances, distinctive foods, and the like – and presents religions in such a bland way that it is difficult to imagine why throughout history people have been slaughtering one another over religious differences. As with the social studies in general, high-quality learning about world cultures needs better content as well as improved methods. There is much that needs explaining within the sphere of cultural studies; knowledge building based on what students wish to understand is not only an intellectually desirable way of going at it, but also a way to avoid some of the minefields that educators know only too well.

### Literature

We will take it as generally agreed that the main goal of literature teaching at the school level ought to be improving the quality of students’ literary experience – their experience of particular works under study and more generally their capacity for deep literary experience. Literature often serves other purposes in schools, such as illuminating history and social issues, fostering wisdom and moral sense, and serving as a launching pad for discussion of personal experiences and concerns. Although these are defensible uses, it is important that they not become diversions from the main task of engaging students more fully and actively in the literary experience (Rosenblatt, 1956). If the main proximate goal of literature teaching at the school level is accepted to be ensuring that students have quality literary experience, this does not quite answer the question of what constitutes quality *learning* in literature. The congruent learning objective would be increasing students’ capacity for quality literary experience in their independent reading, in and out of school – equipping them with the skills, values, and habits of mind that will lead them to seek out good literature and to enjoy the rewards of reading

it. This raises two further questions: How is this capacity for literary experience to be cultivated and what, if any, role does explanation-seeking inquiry (i.e., theory building) have in such learning?

The question of how to increase students' capacity for literary experience is one of the questions that most sharply divides the Whole Language movement from more instructionally oriented approaches (Harris, 1993), and it remains an important issue quite apart from the continuing battles about the teaching of phonics. Instructional approaches, as represented in mainstream basal language arts series, put a heavy emphasis on reading comprehension skills. "Teaching" a literary selection centers on comprehension questions, with ancillary work on comprehension strategies and vocabulary development. Whole Language, by contrast, focuses on the immediate literary experience, with the implicit assumption that one builds capacity for literary experience by having literary experience. Compromises between the two positions are of course possible, and basal programs typically seek some balance. There remains the possibility, however, that an emphasis on comprehension interferes with rather than enhances literary experience. This leads us to the second question, about the role of explanation-seeking inquiry.

Like explanation in other fields, literary interpretation is a kind of theory building – in this case, building a theory that explains the meaning or intent of a particular text. Like historical explanations and medical diagnoses, literary interpretations are theories of particular cases. On one hand, literary interpretations can be public objects, developed and refined through collaborative discourse and open to criticism on empirical and logical grounds. On the other hand, they inevitably reflect the subjective experience and literary sensibilities of the interpreters. Consequently, there can be alternative interpretations that are equally compatible with the facts but that appeal to different people. The same has been said about historical explanations (Limón & Carretero, 1999). This is not the "incommensurability" that Thomas Kuhn (1970) attributed to scientific theories rooted in different paradigms, but rather incommensurability reflective of the inevitable subjectivity that enters into statements about what a given literary text "really" means. To some literary scholars, even the author's own statements about what the text means are not to be taken as definitive (Rosenau, 1992, pp. 25–31). However, a path toward rendering alternative historical and literary interpretations comparable is suggested by Thagard's (2003, 2006) concept of emotional coherence. Emotional coherence, as formulated by Thagard, includes both rational coherence (logical consistency and consistency with facts) and coherence with feelings about the actors and their

actions. This could extend to feelings about a literary work as artifact and about the author's attitudes as reflected in the work.

What makes explanatory theorizing problematic in a literature curriculum is the effect it may have on the main goal of raising the quality of literary experience. T. S. Eliot (1932, p. 200) famously declared that "genuine poetry can communicate before it is understood" and reported that he fell in love with Dante's *Divina Comedia* in the original Italian before he could understand any Italian – responding, thus, to the prosody without any of the semantic content; but he was evidently an exception. Evidence from thinking-aloud studies has shown that students do not begin to respond to a poem as literature until they have worked out its literal meaning (Church & Bereiter, 1983; Peskin, 1998). In effect, this means translating the poem into more readily comprehensible prose. Such translation is a form of inquiry, and it could be argued that it interferes with getting into direct contact with the work as a fully integrated poetic object. A cautious position would be that some degree of literal comprehension is required, but it should not be carried to the extremes we have seen in some basal reading programs, where every unusual word is defined in advance and comprehension questions probe minute details of a story as if it were a legal agreement. Clifton Fadiman, at an informal meeting, once remarked on how, as a child, his experience of reading classic stories was enhanced by not being able to understand all the words: it left him to fill in the gaps by his own imagination.

Inquiry does have a definite place after students have experienced and shared the experience of a piece of literature. A proper question, once the effects of the piece have been identified and elaborated, is "How did the author achieve these effects?" What makes the piece funny, scary, unsettling, beautiful? This is an occasion for theory building, drawing on evidence internal to the text. It is a natural for student-directed inquiry. However, it also represents a shift of perspective from that of consumer of literature to its producer. It is "reading like a writer" (Smith, 1983). If, for instance, it is agreed that a story is suspenseful, students may be encouraged to ferret out the strategies and tricks the author used to build up suspense. These may range from word choice to overall structure (Bereiter & Scardamalia, 1984). Students may notice, for instance, that the author lets the reader know of a danger that the main character is unaware of, so that the reader feels a strong urge to warn the character but is of course unable to do so and must remain helpless as the danger mounts. A natural transition from reading to writing can then occur as students try to produce suspenseful yarns of their own, using the techniques they have identified. "Reading like a writer" is a different kind of

inquiry from literary interpretation, but it can add another layer to the experience of literary appreciation.

We have skirted the question of what is the nature of literary knowledge. Obviously, a great many different kinds of things can be known about a literary work, but what does it mean to have a thorough knowledge of the literary work itself? As with other kinds of knowledge *of*, as distinct from knowledge *about* (cf. Bereiter & Scardamalia, 2006), a useful analogy is to knowledge of a geographical place. As an occasional visitor to a city, you may know how to get from certain locations to certain other locations and you may have some knowledge of how major landmarks are situated with respect to one another; but if you really know the city, you can pretty much find your way from any place to any other place in it. As the common saying goes, you “know your way around.” High-quality knowledge of literature might similarly be characterized as *knowing your way around* – knowing your way around in certain major literary works and more generally knowing your way around the world of literature.

Greeno (1991) applied this same concept to number sense, defining it as knowing your way around in a numerical domain. With respect to literary knowledge, this does not mean you can readily find a desired quotation in a large book, but it does mean that any literary snippet you read is perceived within a context that gives it more meaning and that enhances your experience of it. Greeno suggested that number sense comes from crossing and recrossing a numerical domain along many different routes and with many different objectives. We suggest that quality learning experience in literature should similarly involve crossing and recrossing great books and great literatures by various routes of inquiry, comparison, and experience sharing.

There are great books of which deep and thorough knowledge comes only after years of reading and contemplation. There are Milton scholars, Cervantes scholars, and scholars of great religious texts for whom this is true, but we do not expect young students to achieve anything like their depth of knowledge – knowledge that comes from the thousands of hours of effort required to attain an expert level in any field (Ericsson, 2006). However, it is not unrealistic to expect that the literary knowledge students do acquire should tend in that direction, that quality learning in literature should constitute an early form of knowledge *of* rather than a growing collection of knowledge *about*.

### Quality of Learning in History, Social Studies, and Literature

History, social studies, and literature are established parts of school curricula that in recent times have suffered in comparison to natural science,

mathematics, and academic skills training. It has been harder to make a convincing case for their importance (even though no one proposes abolishing them). Although pinning down the educational benefit of the content of these fields is open to controversy, we can probably assume general agreement that learning the content with understanding is preferable to learning it without.

In the foreword to the famous *Taxonomy of Educational Objectives*, its authors raised the issue of teaching for understanding. In the behaviorist language typical of their day, they asked, “Specifically, what does a student do who ‘really understands’ which he does not do when he does not understand?” (Bloom, 1956, p. 1). This is not far off from asking, “What constitutes quality learning?” The *Taxonomy* does not actually answer the question it poses. Instead it defines a ladder of what the authors call “intellectual abilities and skills,” with the implication that understanding (and, hence, quality learning) consists of ability to apply skills of increasingly high level to whatever knowledge is in question. Importantly, these skills are treated as domain-independent – that is, applicable to any subject matter.

In this chapter, we have taken quite an opposite tack. We have started with identifying different characteristics of understanding in different knowledge domains and moved from there to considering differences and similarities in the pursuit of understanding in these domains. Although the *Taxonomy*’s approach reflects a now-outmoded blend of folk and behaviorist psychology, its main failing in our view is that it was based on an impoverished conception of knowledge, treating it as essentially the contents of a mental filing cabinet (Bereiter, 2002). Instead, we have taken a view most eloquently developed by Ernst Cassirer (1944, 1950), which treats human knowledge as amazingly rich, varied, and multiply layered. We recognize that this chapter hardly does justice to these superlatives, but we have tried to work in that direction while addressing the more earthbound issues of school learning.

Quality learning, from the standpoint we have been taking, consists of internalizing and making one’s own the rich, varied, and multilayered knowledge accumulated by the world’s cultures, but also – and this is important – becoming part of a knowledge-creating civilization’s continuing efforts to improve and extend that knowledge. Theory building, as characterized here, is synonymous with the systematic, collaborative pursuit of understanding. We have emphasized that theories are not purely rational, bloodless things. They are tied to authentic problems of understanding, and a full range of work required to build knowledge – developing models, conducting experiments, relating ideas to lived experiences, and so forth. Especially in the humanities and social studies as studied in school, good theories include the motives and feelings of human actors and may reflect the values and personality of the

theorizer. All that authentic theorizing requires (to distinguish it from the fanciful spinning of explanatory ideas) is continued striving toward higher degrees of explanatory coherence (Thagard, 2000). Even at that, theory building is not the totality of the pursuit of understanding. There is, for instance, what Lakoff and Johnson (1999) call “embodied understanding.” Theory building, however, has the important advantage of linking directly to the societal effort (as distinct from the many personal efforts) to advance knowledge and understanding. In the twenty-first century, with its worldwide need for new knowledge on every front (cf. Homer-Dixon, 2000, 2006), ability to produce and improve theories is an important educational objective in its own right, integral to but not the same as understanding itself. Theory building as an aspect of quality learning was well enunciated by a Grade 5 student in a class we worked with. When asked how she would know when she had learned something, she said: “I think that I can tell if I’ve learned something when I’m able to form substantial theories that seem to fit in with the information that I’ve already got; so it’s not necessarily that I have everything, that I have all the information, but that I’m able to piece things in that make sense and then to form theories on the questions that would all fit together.”

This level of knowledge about knowledge provides a foundation for quality learning through inquiry. To many adults, a theory is merely a factual claim that lacks conclusive proof – a view apparent in any open online discussion of evolution. This student has progressed far beyond that, to the view neatly summarized by Kenneth Miller (2000, Worksheet #3): “Theories don’t become facts, theories explain facts. This means that in scientific terms, theories actually present a higher level of understanding than facts.”

High-quality learning in the so-called knowledge age will include theoretical understanding, active creating and improving of theories, and – emerging from both – an appreciation of the essential role of theories in knowledge advancement. This is perhaps uncontroversial, but in our experience from two decades of promoting it, the proposal that all of this can and should start at the primary-school level still has some way to go before it attains general acceptance among educators (Scardamalia & Bereiter, 2006).

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