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# ACTION, TALK, AND TEXT: THE CASE FOR DIALOGIC INQUIRY

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[This article is based on Chapters 1 and 10 of *Action, Talk and Text: Learning and Teaching Through Inquiry*, Teachers College Press, 2001.]

## Introduction

For ten years, while I was at the Ontario Institute for Studies in Education, University of Toronto, I had the good fortune to work with a group of teachers with whom I and two colleagues formed a school-university partnership to carry out collaborative action research, supported by grants from the Spencer Foundation. Initially, our aim was to investigate the role of spoken discourse – talk – in the learning and teaching of science, in grades one through eight. However, as a result of our experiences in the first two years, our aims quite quickly broadened to include written as well as spoken discourse and not simply science but other areas of the curriculum as well. We also quickly came to realize that the quality of discourse depended on the extent of the participants' engagement in the topic under discussion. Our collaborative inquiry thus became an exploration of how to create the conditions that promoted sustained student engagement and a willingness to engage in discourse that aimed at increasing understanding. Briefly stated, the conclusion we arrived at was that, in our classrooms, we needed to create *communities of inquiry* in which all were encouraged to ask “real” questions and together to attempt to construct answers to them. At the same time, we recognized that we should ourselves form a similar community and that, in addition to our classroom-based research, we should also investigate our own practice as a group of collaborating teacher researchers. For this reason, the name we chose for our group was *Developing Inquiring Communities in Education Project (DICEP)*.

After some eight years, we decided that we would like to share our work and the principles on which it was based with a wider public. And so began the preparation of the book, *Action, Talk, and Text: Learning and Teaching Through Inquiry*. Not all of those who were or had been members of DICEP took up the invitation to contribute chapters, but from those who did we assembled a range of investigations that, together, give a good idea of the scope of the project and succeed in conveying a sense of what members gained from their participation in the group. It is noteworthy, I believe, that the group still continues to conduct teacher research in their various educational settings. A recent collection of their investigations can be found in *Networks*, 6 (1), 2003  
<<http://education.ucsc.edu/faculty/gwells/networks/>>.

This article brings together much of my own contribution to the book and attempts to explain the group's emphasis on inquiry and on the mediating roles of action, talk and text in education.

## THE CASE FOR DIALOGIC INQUIRY

As a research group, the members of DICEP consider the development of a theoretical framework to be an essential part of carrying out action research. In the effort to understand as well as to improve one's practice, theory both grows out of practice and helps in making sense of it; it also suggests the kinds of improvement that might be attempted and provides a rationale for explaining the reasons for these changes to others. At the same time, theorizing is never finalized, since it is conducted in a dialogue with others; it is also only valuable when it shapes and is shaped by action. This has been the case with the theory presented here. Of course, it is only one person's way of putting the key ideas together, but the framework itself has been developed over many years of dialogue: with the other members of DICEP, with colleagues around the world, and with authors - many no longer living - who have contributed to its development. However, since for some readers, the ideas presented here may be unfamiliar, I shall attempt, where possible, to make them more meaningful by illustrating them with reference to the inquiries reported by my teacher colleagues.

Everywhere there is currently much talk about a crisis in public education and a need for major reform. At the same time, there is a widespread lack of agreement about what form education should take in the century ahead and about the kind of changes that most need to be made. On the one hand, policy makers and educational planners emphasize the need to improve standards and accountability. They talk about improving the "delivery" of a standardized curriculum, of "outcomes," and of nationwide forms of assessment that will ensure that these outcomes are achieved. On the other hand, the message of academic researchers is more concerned with students achieving "depth of understanding." Instead of outcomes, they emphasize "process," and the importance of "inquiry," "construction," and "collaboration." Between these two perspectives on education lies the arena of day-by-day classroom practice. This is the disputed territory inhabited by practicing teachers. Although often sympathetic to the philosophy underlying the latter perspective, they are nevertheless forced by their conditions of employment to act in conformity with the former.

The reasons for this mismatch are in large part historical and are to be found in the social, economic, and intellectual changes that took place during the twentieth century and, more important, in the ways in which those with different responsibilities for public education have responded to them. Certainly, the last hundred years have seen a massive increase in the scope of public education and in the expectations about what it should achieve. Whereas, a century ago, a minimum functional competence in reading, writing, and arithmetic was considered an adequate target, current demands for complex forms of information handling in the workplace have substantially raised the requirements for print, mathematical, and computer literacy (Resnick, 1987), and for a basic familiarity with key concepts in the natural and human sciences. In addition, whereas in the past only a small proportion of school graduates was expected to achieve a college or university qualification, this is now the target for the majority, with a high school

diploma being the minimum requirement. With the resulting vast increase in the scale of responsibility for educational provision, it is not surprising that policy makers and administrators should be preoccupied with universal outcomes, with the maintenance and improvement of standards, and with accountability to parents and taxpayers for the services they provide.

In itself, this macrolevel concern with standards, equity, and accountability is admirable. However, the form in which this concern is being realized in practice is much less acceptable. Education cannot be reduced to a utilitarian preparation for the workplace, however technologically sophisticated the skills that are being trained. Nor can the activity of learning and teaching be managed as if it were a sequence of operations on a production line, with uniformly adaptable, knowledgeable workers as the intended outcome. Education is only secondarily about the preparation of the workforce. Its primary concern is with the maintenance and improvement of society in all its manifestations and with enabling individual students both to contribute to society and to achieve their human potential. As many of the great pioneers of public schooling realized, the health of a democratic society and, hence, the well-being of its members, depends on the committed and informed participation of its citizens in making decisions about public affairs and in putting those decisions into effect. From this perspective, therefore, just as important as the acquisition of productive skills for the marketplace is the development of a critical understanding of the relationships between socially valued ends and the means for achieving them, and of the disposition to use both skills and understanding in ways that contribute to the common good as well as to the satisfaction of individual or sectional interests. A commitment to these transformative goals of education clearly has implications for the manner in which learning and teaching are carried out, day by day, in schools and classrooms.

It seems evident to us that, in order to be able to participate effectively as adults in a democratic society, students must engage in activities in school that induct them into the values and practices that should characterize such a society, as well as equipping them with the knowledge and skills necessary for productive participation. On the one hand, this means that, from the beginning, students need to be given the opportunity to develop personal initiative and responsibility, adaptable problem-posing and -solving skills, and the ability to work collaboratively with others (Dewey, 1916). And on the other, it means that classrooms and schools must themselves become more democratic, more critical of the ways in which knowledge is created and used, and more willing to listen respectfully to students' opinions and suggestions. This focus on understanding - that is to say, knowing oriented to effective and responsible action - is also the thrust of most of those educational reforms that have been influenced by recent developments in research and theorizing about how people learn.

As will be explained in more detail in the rest of this article, this work has shifted the emphasis toward students achieving personal understanding of information rather than simply being able to recall it on demand, and to co construction rather than transmission as the means by which this understanding is achieved. In addition, rather than assuming that all classrooms and their members are essentially equivalent and that, therefore, one

curriculum fits all, it is now being recognized that classroom communities are each unique, always situated in particular times and places and made up of diverse participants - teachers as well as students - with individual identities, interests, and motivations. It is thus clear that there can be no universal blueprint for successful learning and teaching. Each classroom must find its own way of working, taking into account both what each member brings by way of past experience at home, at school, and in the wider community- their values, interests, and aspirations - as well as the outcomes that they are required to achieve. From this perspective, it is also recognized that the evaluation of what students have learned cannot be adequately achieved by standardized assessment, using decontextualized multiple-choice or short-answer tests (Gipps, 1999). More valid as a measure of the progress that has been made is an evaluation of a student's ability to bring his or her knowledge and skills to bear in solving new problems that are of some personal significance, and an assessment of the strategies that he or she uses in the process. That is to say, in order to know how well students, teachers, and schools are achieving their objectives, it is necessary to find ways of carrying out authentic assessment.

Clearly, the differences just sketched between these two broad perspectives are due in large part to the different responsibilities of those who adopt them with respect to the education of the student population. But it also stems from the different conceptions of knowledge and of coming to know that are presupposed by these two perspectives and from the role that language and other meaning-making systems are believed to play in the construction, use, and dissemination of knowledge. The changes that have taken place in these areas constitute another important aspect of the context of our work that needs to be considered.

### **Changing Views of Knowledge and Coming to Know**

As well as an increasing demand for more knowledgeable graduates from public education, the last hundred years have also seen important changes in the way in which knowledge itself is understood (Case, 1996). At the beginning of the century, most people thought of knowledge as "true belief," that is to say, as the sum total of those facts and theories that had been empirically verified and could therefore be taken to be correct. Such beliefs, it was supposed, could in consequence be treated as objective, independent of particular knowers and of the cultural conditions under which they were established. Certainly, this view of knowledge has sustained the advances made in the natural sciences and in the technological application of their findings in industry, most notably in the rapid rise in the last two decades of computerized communication and information processing. It has also had a significant influence on the way in which large organizations are managed.

Not surprisingly, this positivist view of knowledge has also been influential in education, both in shaping the content of the curriculum and in prescribing the practices of instruction and assessment. According to this perspective, the major function of education is to ensure that students acquire the knowledge that is considered most useful and important, and teaching is conceived of in terms of organizing what is to be learned

into appropriately sized and sequenced chunks and arranging optimal methods of delivery and opportunities for practice and memorization. However, while it is obviously important that students should be helped to take possession of the accumulated knowledge that is valued in the society in which they are growing up, this cannot be achieved by simple transfer. In other words, knowledge cannot be handed over as if it were the intellectual equivalent of a bag of groceries to be delivered, or a message to be transmitted and received over the Internet.

To see the inappropriateness of the "missionary" conception of communication, it is only necessary to compare reports of the same event in different newspapers. What is considered salient varies from one to another and, unless the copywriters are quoting verbatim from an identical source, the beliefs, opinions, and motives attributed to the principal participants are often markedly different. More important, each newspaper has its own slant on what is considered to be significant. At the same time, a similar variability is also to be found in the readers of anyone of these papers. We each have our own interests and current concerns, along with varying amounts of relevant past experience; these influence how we make sense of what we read and how we determine its significance for future action (Kress, 1997). Thus, reading involves an active transaction with, and interpretation of, new information, and because of our unique life trajectories, we each construct different versions of what we read.

The same diversity is equally true of learning. Just as important as what is common to groups of individual students in terms of their biological human inheritance is the diversity that characterizes any class or school, particularly in large urban centers, such as the one in which DICEP is located. Not only do students differ in gender and ethnic and social background, in the language(s) that they speak at home, and in their current levels of performance on school tasks, but they also differ in the values they have learned at home and in their aspirations, interests, and experience outside the school. Given this diversity in what students bring to school and to each curricular activity in which they engage, it is clear that the administrative desire to implement a one-curriculum-fits-all model, in which knowledge is identically delivered to passive student receivers, is completely at odds with current conceptions of how learning occurs (G. Brooks & M. G. Brooks, 1993).

Furthermore, theories of knowledge and coming to know that fail to take student diversity into account provide little help for teachers, who not only have to respond appropriately to the different individuals for whom they are responsible but who, themselves, differ in similar ways. Teaching, like learning, involves an active coconstruction of knowledge in collaboration with particular students in a particular place and time. It also involves the teacher as an individual, who has values, beliefs, and interests, as well as preferred ways of working with students, that have been learned and modified over the course of a lifetime of personal and professional experience. Teachers, like students, bring the whole of themselves to their interactions in the classroom; whether they are aware of it or not, their manner of teaching depends not only on what they know but on who they have become.

## **Constructing Knowledge in Collaboration with Others**

The conceptions of knowing and coming to know that are currently accepted by those working in the human sciences have resulted from two major changes that have taken place during the course of the last century. The first of these challenged the idea that knowledge is passively acquired as a result of being shown or told and, instead, proposed that coming to know always involves an active constructive process, in which new information must be brought into relationship with what is already known. If the new information appears to be compatible with what is known, it will be easily assimilated, although it may be reformulated to some degree in the process. If, on the other hand, it is in conflict with what is known, either the new will be rejected or existing knowledge will have to be transformed in order to accommodate the new. In either case, what is known by any individual is the outcome of a continuing constructive process that depends on opportunities to encounter and make sense of challenging new experiences.

"Constructivism," as this way of thinking about coming to know is called, owes a great deal to the work of Piaget (1970) who, on the basis of numerous detailed observations and experiments with children, proposed an account of intellectual development that emphasized the learner's active, exploratory transactions with the environment. In his view, the successive stages to be observed in children's development resulted from major constructive transformations of their ways of making sense of their experience that depended both on the maturation of innate structures and on the occurrence of experiences that gave rise to cognitive conflict. In the 1960s, Piaget's theory became the basis for programs of early education that emphasized "discovery learning" and a supportive rather than a directive form of teaching. Although the majority of educators would no longer give so much weight to independent discovery as the key to learning, Piaget's conception of the learner as actively constructing his or her own knowledge on the basis of what he or she brings to encounters with new information and experience has taken a firm hold and is presupposed in almost all recent work on learning and development. As is generally agreed, "knowledge is not passively received either through the senses or by way of communication; rather, knowledge is actively built up by the cognizing subject" (Glaserfeld, 1995).

The second change occurred, at least in part, in reaction to the first. Piaget's concern was with what is universal in human intellectual development. What he paid less attention to was the cultural context within which development occurs (Cole & Wertsch, 1996). For Vygotsky, by contrast, this was at the heart of his account of learning and development, and significantly, in much of his writing, he used his criticisms of Piaget's ideas as the basis for the development of his own. However, although Vygotsky was writing in the 1920s and 1930s, that is to say in the postrevolutionary period in Russia, it is only since the 1980s that his ideas have begun to become known in translation; since then, his sociocultural theory has stimulated increasing interest among educators and has inspired a number of important attempts to realize his vision in practice (Gal'perin, 1969; Holzman, 1995; Moll, 1990; Wells & Claxton, 2002). In contrast to Piaget, Vygotsky placed strong emphasis on the importance of culture and social interaction in accounting for individual development.

According to Vygotsky (1978,1987), the relationship between the individual and the culture of which he or she is a member is one of interdependence; in their development, each shapes and is shaped by the other. Of course, to some extent at least, Piaget also recognized the importance for the child's intellectual development of knowledge obtained through social interaction with others; however, he considered this interaction to be simply a source of information, rather than essential to the very process of development. By contrast, Vygotsky argued that, although based in our biological inheritance, the capacities for acting, thinking, feeling, and communicating that make us human are crucially dependent on cultural practices and artifacts and on interaction with others, through which these practices are appropriated and mastered in the course of goal-oriented joint activity. We become who we are, he argued, through engaging in culturally valued activities with the aid of other participants and through the use of the mediating artifacts which the culture makes available. In these particular, "situated" events, both activities and artifacts are transformed, as are our own resources for thinking and doing, as, acting together, we adapt, extend, and modify both intellectual and material resources in order to solve the problems encountered (Wells, 1999).

The significance of Vygotsky's theory for conceptualizing the relationship between knowledge, coming to know, and educational practice is far reaching. First is the emphasis that he placed on the role of artifacts in mediating activity. These include not only material tools (such as knives, wheels, and more recently, combustion engines and computers), but also symbolic meaning-making systems, such as language, mathematics, and various modes of visual representation, as well as the representational artifacts that are created through their use, such as maps, historical accounts, scientific theories, and works of art of all kinds. Such artifacts also include the institutions, such as education and law, multinational corporations, sports clubs, and religious societies that provide the organizational frameworks within which a culture's activities are organized (Engeström, 1990). Traditionally, in education, attention has been given mainly to representational artifacts, such as textbooks and works of reference. Because such artifacts are so integrally involved in intellectual activity of many kinds, they are often treated as if they were actually repositories of knowledge that can be mastered simply by reading and memorizing them. Nevertheless, such a belief is mistaken. Artifacts of all kinds, both material and symbolic, certainly encode the knowledge that went into their production and can, in that sense, make it available to other people. However, in order genuinely to master the cultural knowledge associated with these artifacts, novices must actively participate in the activities in which the knowledge is used, construct their own understanding of it, and be assisted and guided by others in learning how to do so (Lave & Wenger, 1991; Rogoff, 1994).

It was to explain the characteristics of this assisted performance that Vygotsky (1987) developed the concept of the "zone of proximal development" (ZPD). This is the second feature of his theory that is important for education. Taking issue with the use of intelligence tests to categorize and place children with what would now be called severe learning difficulties, he argued that it is not the child's independent performance that should be the basis for making educational decisions but the extent to which he or she can

benefit from appropriate teaching. This window between what a learner can manage to do alone and what he or she can achieve with help is what Vygotsky meant by the zone of proximal development. It is this zone that should be the target for all teaching for, as he argued, it is only "instruction which moves ahead of development, and leads it" that is helpful to the learner (1987, p. 211). The significance of this principle has been explored in many DICEP inquiries, in particular in this volume by Van Tassell (Chapter 3), Davis (Chapter 4), and Kowal (Chapter 7).

Vygotsky died before he could develop this key insight further but, in more recent work, it has been extended in a number of ways. First, it has become clear that the ZPD is not a fixed attribute of the learner; instead, it is specific to the task in which he or she is engaged and it is created in the interaction among the learner, the available cultural resources, and the person(s) who are providing assistance. Second, it is not only teachers who can perform this function; peers can also provide assistance to each other and so can artifacts produced by those who are not present in the situation, such as books, illustrations, and information accessed via the Internet. However, it is important to emphasize that such artifacts only assist learning and performance for those learners who already have the skills and disposition to actively engage with them. Third - and perhaps most important - learning in the ZPD is not restricted to students; teachers too can learn in the same way, both from colleagues and from the students that they teach. In fact, working in the ZPD should be a learning experience for all participants, although, obviously, what each learns depends on the different concerns and prior knowledge that they bring to the situation (Wells, 1999).

The importance of recognizing and valuing diversity is a further implication that follows from his theory. Vygotsky stressed the need to adopt a historical approach in attempting to understand development. This is important on at least three levels. First, both what is considered necessary for students to learn and the levels of performance they are expected to reach at each stage are cultural constructs that change over time; these expectations also differ from one culture to another as a result of the historical differences between them in the ways in which they have interacted with their immediate environments (Diamond, 1998). Second, individuals, too, have different life trajectories; not only is each person born into a particular culture at a particular point in its history, but the specific sequence of experiences that shapes who she or he becomes also differs from one individual to another, even within the same culture. This means that, even when involved in the same activity, participants inevitably understand it somewhat differently from each other and have different contributions to make to it; they may even have quite different goals in view as well as different ideas about how to attain them. Finally, since learning takes place through participation in particular, situated activities, we also need to consider the microhistory of these activities.

As has just been suggested, the way in which an activity unfolds depends upon the specific participants involved, their potential contributions, and the extent to which the actualization of this potential is enabled by the interpersonal relationships between participants and the mediating artifacts at hand. These principles are obviously important when organizing learning and teaching activities, for they contradict the belief that the

curriculum can be planned and delivered in a predetermined manner and emphasize, instead, the extent to which the action and interaction through which learning occurs are emergent in the situation and dependent on the uptake of "teachable moments," as they arise. Similarly, from a research perspective, these principles underscore the need to attend to the way in which meanings and understandings are progressively constructed over time as events and ideas are revisited, extended, and reflected on in the discourse of groups and the whole class together.

### **Knowing in Action and Reflection**

Taking into account these insights from the work of Piaget, Vygotsky, and those who have extended their work, we arrive at a very different understanding of knowledge from the one that prevailed at the beginning of the twentieth century. Knowledge is not fixed, autonomous, and independent, as proponents of the "knowledge transmission" conception of education seem to believe. But neither is it contained as sentence-like propositional objects in individual minds, to be retrieved and processed on demand, as is suggested by those who take the computer as their metaphor for intellectual activity. Rather, knowledge is constructed and reconstructed between participants in specific situations, using the cultural resources at their disposal, as they work toward the collaborative achievement of goals that emerge in the course of their activity.

Put rather differently, then, knowledge is only truly known when it is being used by particular individuals in the course of solving specific problems; and then it is open to modification and development as it is reconstructed to meet the actual demands of the situation. In other words, to place the emphasis on the acquisition of "general knowledge" independent of occasions of its meaningful use is to reverse the way in which, over many millennia, it has been constructed and appropriated in and for situated action. Even the theoretical knowledge that we rate so highly is only of value when it is used in solving problems, and then the solutions achieved nearly always have implications for practical action in real-life situations. Thus it is on knowing in action undertaken jointly with others that the emphasis needs to be placed, and on opportunities for reflecting on what has been learned in the process. It is in this situated knowing, involving both action and reflection, that the knowledge of more expert others comes to make personal sense and is most readily incorporated into one's own personal model of the world.

This is what we understand Vygotsky to have intended when he emphasized the importance of working in the zone of proximal development. For what students come to know and to be able to do depends on the type and range of activities that they are asked to engage in, on the challenges that these activities present, on the artifacts available to mediate their activities, and on the assistance they receive in meeting these challenges, both from teachers and peers and also from more distant experts beyond the classroom.

Considering now the implications of this view of knowledge, several things seem clear. First, in designing curriculum, it is not decontextualized knowledge that should be given pride of place. Rather, it should be problems and questions that are likely to be of significance to students as they try to understand and act effectively and responsibly in

the world that they inherit from previous generations. As we are becoming more fully aware, progress is by no means inevitable, and our current way of life presages potential disasters as well as possible improvements. Which of these come to pass will depend very much on the decisions taken by the citizens of tomorrow, and these decisions, in turn, will depend upon the education that tomorrow's citizens receive today. Certainly, the knowledge that has been developed in the past is likely to be important to our students in this quest for understanding and responsible action. But it is important to them, not as an inert body of propositions and procedures detached from any personally meaningful situation, but as a compendium of resources - a tool kit - to be mastered and modified in and for use in solving problems that are of significance to them. This does not mean abandoning the conceptual frameworks provided by the established disciplines. These are also tools - or, better, tool kits - that have been built up over generations as means for tackling tasks in particular domains. However, no one of them has universal validity; each is the best that is currently available for solving certain types of problems, but each is also open to further revision and improvement. Furthermore, many real-life problems require the utilization of knowledge from several quite different domains and therefore also of different modes of knowing (Donald, 1991).

The second implication is that, in learning and coming to know, students should not be thought of as solitary individuals, each working independently of - and often in competition with - others. Our achievements are never exclusively our own since they are always made possible by our being able to take over and use resources created by others; without these cultural resources we should not be able to function at all. This is true of the greatest thinkers as well as of students in school. As Newton remarked, he only succeeded "because he stood upon the shoulders of giants". In fact, collaboration has always been the most powerful approach to problem solving, and it is equally effective as the basis for learning. Thus, while it is important for each individual to gain the level of autonomy and self-direction necessary for responsible decision making and action, it is equally important to emphasize mutual interdependence and the value of collaboration.

Third, placing the emphasis on knowing rather than on knowledge also has the advantage of drawing attention to the different modes of knowing that are involved in solving the wide range of problems that are encountered in daily life (Gardner, 1983; Wells, 1999). Currently, our society accords greatest value to theoretical knowing and to the ability to deal in generalizations and abstractions that can be manipulated independently of the particular objects, events, and relationships to which they refer. It is this sort of knowing that is emphasized in high school and universities and that provides entry to high status professional occupations. However, it is important to recognize that this mode of knowing can only be built upon prior experiences of tackling problems arising in the course of specific, practical activities and that, furthermore, its ultimate value is in advancing understanding and enabling more effective action in the future.

A further implication is that there can be no scale on which the achievements of either individuals or cultures can be measured or compared in absolute terms. All modes of knowing have arisen to mediate the activities of cultural groups in the particular ecological environments in which they find themselves. The particular modes that have

developed in different cultures over the course of recorded history can be seen to have been influenced both by the affordances and constraints of the local environment and the problems it posed for survival, by the world view and values of the culture, and by the impact of outside influences as a result of conquest or colonization. The current hegemony of Western technical-rational knowing itself owes much to a particular historical sequence of chance events and should not, therefore, be thought of as having universal superiority (Diamond, 1998). Indeed, there are many problems facing the world today for which it does not provide useful solutions. For this reason, as Van Tassell (Chapter 3) and Kowal (Chapter 7) make clear, it is important in planning curricular units to emphasize the interdependence of the different modes of knowing, recognizing that as different modes are best suited to different tasks, all are equally necessary for the activity as a whole.

The last and perhaps most important point to make is that knowing in any mode is not a purely cognitive process. All modes of knowing are embedded in action, and since they are mediated by material tools of various kinds, they involve the body as well as the mind. Recognition of this might help us to abandon the prevalent conception of the mind as a container of disembodied ideas and to see it instead as a way of talking about "mindful" or purposeful and informed knowing in action. Nor is knowing a purely individual activity. It not only depends on the mastery of mediational means appropriated from other members of the culture, but it also almost always occurs in the course of activity undertaken with others and only has significance in relation to such activity.

Finally, knowing is not a dispassionate activity, unaffected by emotion. On the contrary, not only is it accompanied by feelings of effort, occasional frustration, and satisfaction when goals are achieved, but the motivation to engage and persevere with a problem is rooted in commitment to values and purposes that are strongly affective in origin. In sum, knowing and coming to know involve the whole person. Furthermore, it is through their participation in activities with particular others, involving different modes of knowing and acting, as well as the use of the appropriate mediational means, that individuals develop their unique identities and their potential to contribute to the wider society.

### **Discourse and Knowing**

It might seem self-evident in the light of the preceding discussion that language is at the heart of education. Not only does it mediate the knowing in which students engage, but it is also the chief medium of the activity of learning and teaching. Perhaps it is just because this seems self-evident that so little attention is typically given to the ways in which language is used in schools; its uses are simply taken for granted. However, in the last quarter of a century a growing body of research has begun to describe in some detail the different emphases that are given to spoken and written language at different ages and in different areas of the curriculum and to document the different functions that language serves in the various activities that constitute learning and teaching (Barnes, 1976; Britton, Burgess, Martin, McLeod, & Rosen, 1975; Galton, Simon, & Croll, 1980; Martin, 1993; Nystrand & Gamoran, 1991).

What emerges from this classroom-based research is evidence that a large proportion of educators make an implicit, although quite sharp, distinction between language, which they see as a means of communication, and the intellectual activity of individuals that generates the thoughts that are communicated. This separation frequently gives rise to what has been referred to as the "conduit" metaphor of communication (Reddy, 1979): language carries thoughts as trains carry goods, with no interaction between them. The results of this separation are that, on the one hand, work on language is largely devoted to the formal features of written language - rules of grammar, spelling, essay structure - often learned and practiced with no genuine interest in what the writing is about, and on the other hand, attention is rarely given to the implication of the fact that the processes of thinking, such as categorizing, hypothesizing, reasoning, and evaluating, are not only realized in language, in the sense of being made manifest in speech and writing, but also actually constructed and improved through its mediating means.

It is this separation between language and thinking that underlies the repeated finding that, in a majority of classrooms, there is a prevalence of what Tharp and Gallimore (1988) call the "recitation script." In such classrooms, what is given pre-eminence is teacher talk, the reading of textbooks for information transmission and consolidation, and multiple-choice tests or short essay answers to check that the information has been correctly received and memorized. However, as will be clear from the previous discussion of knowledge and knowing, students do not come to know simply by listening and reading, nor does spoken or written recall of information on demand provide satisfactory evidence of the extent to which there has been a real increase in understanding.

If, as I have suggested, knowing is largely carried out through discourse, we should not be looking for learning in the time between the input from the teacher or text and later output in answers to spoken or written questions. Rather, we should expect to find the learning occurring in and through participation in the activities that make up the curriculum and, in particular, through the discourse that often constitutes the greater part of these activities (Nuthall & Alton-Lee, 1995). This means that students' opportunities for learning and knowing are crucially dependent on the nature of the activities in which they engage and on the functions that language performs in these activities.

In classrooms in which the conduit metaphor of communication is implicitly accepted, most activities involve monologic uses of language, either in speech or writing, with a clear role and status distinction between teacher (or textbook author) and students. Teachers and textbooks transmit information and students demonstrate that they can reproduce it on demand. These characteristics are also apparent in the recitation script; although involving teacher and students in alternating turns, it is nevertheless typically controlled and directed by the teacher's questions (often concerning information students are supposed to "know") and the evaluations that the teacher gives to the students' responses (Mehan, 1979). This genre of classroom discourse is frequently referred to as the IRE/F (Initiation-Response-Evaluation/Follow-up) sequence and, in several studies, it has been found to be the default option, to which the teacher always returns (Cazden, 1988; Lemke, 1990).

Recognizing the limited opportunities for real interactive uses of language - and thus for mastering the mediating means of knowing - that are made available to students in discourses of this transmissionary kind, increasing efforts have been made in recent years to find alternatives. Much of the pioneering work has been carried out by leaders in the fields of language and literacy education: Barnes (1976), Britton (1970), Mercer (1995) in England; Moffett (1968), Goodman and Goodman (1990), Harste (1993), Nystrand (1997) in North America; and Christie and Martin (1997) in Australia. But another key influence has been that of Bakhtin (1981, 1986), whose emphasis on "dialogue" has recently become known in the English-speaking world.

Bakhtin was a contemporary of Vygotsky, and although there is no evidence that they collaborated, his work on discourse complements and extends Vygotsky's insights about the role of discourse in the individual's appropriation and mastery of the "higher mental functions" (Vygotsky, 1981). Two of Bakhtin's ideas are of particular importance for education and both are concerned with the essential dialogicality of discourse. The first draws attention to the principle of "responsivity." Utterances both respond to preceding utterances and are formulated in anticipation of a further response. Every utterance, therefore, is "a link in a very complexly organized chain of other utterances" (Bakhtin, 1986, p. 69). The second involves the principle of "multi-voicedness," that is to say, the recognition that, in any utterance, there is more than one "voice" speaking. As Bakhtin observed, in learning to talk, we do not take words from the dictionary but from the utterances of other speakers. The words we use thus carry for us echoes of the previous uses to which we have heard or read them put and, initially, our own use of them is a sort of "ventriloquation," as we speak through the words "borrowed" from others. In both these ways, our utterances are inevitably "filled with dialogic overtones" (Bakhtin, 1986, p. 92); our meanings are taken over from others as well as being our own constructions. These two ideas are particularly significant for the attempts that are being made to situate knowing and coming to know in the coconstruction of meaning that takes place in discourse that is truly dialogic (Wells, 1999). In our own work, we refer to this dialogue as the discourse of knowledge building (Scardamalia & Bereiter, 1992), and as I shall explain below, we see it as an essential component of the inquiry approach to learning and teaching that is the focus of our collaborative research.

The mediating role of dialogue in knowledge building is probably most evident in face-to-face discussion, where one speaker immediately responds to another. In order to make a useful contribution, the current speaker first has to interpret the preceding contribution(s) and compare the information presented with her or his own current understanding of the issue under discussion. Then she or he has to formulate a contribution that will, in some relevant way, add to the common understanding achieved in the discourse so far, by extending, questioning, or qualifying what someone else has said. Other participants contribute similarly, turn by turn. As Bakhtin observed, such discourse is filled with dialogic overtones, for our knowing is part of a joint activity and the understanding we achieve builds on the contributions of others and invites their further response. What is more, it is frequently in this effort to make our understanding meaningful for others that we have the feeling of reaching a fuller and clearer

understanding for ourselves.

Knowledge building also takes place in the written mode, where, although on a different time scale, it works in essentially the same way. When community members write, it is to make a contribution to an ongoing dialogue; they too respond to, and build on, the contributions of others and they also anticipate a further response (see Hume, Chapter 6). However, what makes writing particularly powerful as a mediator of knowing is, first, the possibility it allows for the writer to make an extended, fully worked out contribution, and second, because of its slower rate of production, its facilitation of a more reflective and self-critical stance. In fact, the writer engages in a dual dialogue: with the audience to whom the text is addressed and with him/herself through dialogue with the emerging text. By the same token, reading another's text also needs to be undertaken dialogically. In order to understand it, one not only has to interpret the information it presents, but one also has to engage with it responsively, whether in a dialogue with others or in an inner dialogue with oneself. As in spoken dialogue, therefore, understanding develops through using the texts, both those of others and one's own, as generators of meaning and as "thinking devices" (Lotman, 1988) in the formulation of further responsive contributions.

The sort of discourse just described applies most obviously perhaps to the collaborative building of theoretical knowledge, but in general terms it also applies to the other modes of knowing. Whether theoretical, practical, or artistic, however, one thing is likely to be constant: knowledge building takes place between people doing things together, and at least part of this doing involves dialogue.

Equally important, it is through the same sort of collaborative knowledge building that each of us develops understanding of what other people have already come to know, as this is represented in texts and other knowledge objects. From this point of view, it does not really matter whether the knowledge that is constructed is totally new or only new to us. For, as Popper wrote about understanding the products of theoretical knowing:

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. . . . One could say that the process of understanding and the process of the actual production or discovery [of theories] are very much alike. (Popper & Eccles, 1977, p. 461)

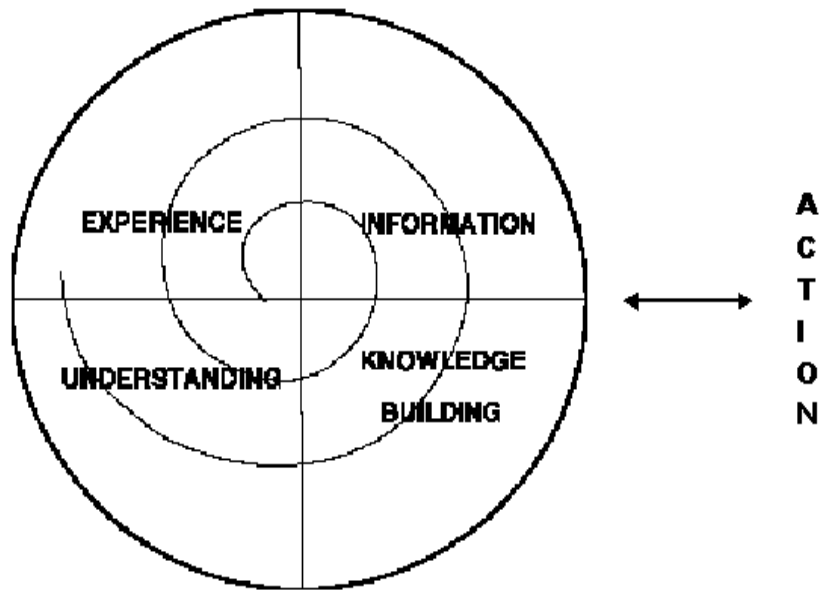
The same also goes for the kinds of knowledge created through the other modes of knowing: we have to engage in meaningful activities with others, using the relevant texts, tools, and practices, in order to come to understand them. It is for this reason that we place such an emphasis on inquiry as a means of learning and coming to know.

## **The Spiral of Knowing**

At this point it may be useful to summarize the main points that have been made above about the relationship among experience, discourse, and the enhanced understanding that,

in our view, is the goal of all inquiry. This I have attempted in figure1.

**Figure 1. The Spiral of Knowing**



Adapted from Wells (1999)

[If this figure is omitted, it can be found at:

<http://education.ucsc.edu/faculty/gwells/ActionSpiral.gif>

[Source: Adapted from Dialogic Inquiry, by G. Wells, 1999, New York: Cambridge University Press. Copyright 1999 by Cambridge University Press. Reprinted with the permission of Cambridge University Press.]

This figure is to be read as a spiral, with each cycle starting from personal experience. Even from an early age, individuals bring at least some relevant past experience to new situations, and this provides the basis on which new learning builds. In the current situation, new information is added from the environment, in the form of feedback from action or, symbolically, through representations produced by others in speech or writing. However, the goal of each cycle is only reached when an enhanced understanding of the matter at issue is achieved, through integrating the new information into the individual's existing model of the world. This integration occurs through knowing in action in some specific situation and almost always involves dialogic knowledge building with others.

As the term implies, knowledge building is an active process of meaning making. It can be achieved through telling stories, developing explanations, making connections, and

testing conjectures, through action and/ or the creation of further symbolic representations in speech or in some more permanent artifact such as a written text. This critical phase in the spiral of knowing is essentially interpersonal and collaborative and always aimed at increasing understanding. If this goal is achieved, each cycle results in an improved and more coherent base of understanding for both the group and participating individuals. That is to say, there is a transformation of their individual models of the world in terms of which to construe further experiences and interpret new information.

This spiraling process continues throughout each individual's lifetime and occurs in practical situations in the workplace and community as well as in educational institutions. It can also continue when the individual is alone, through the dialogue with self that Vygotsky (1987) referred to as "inner speech." However, what distinguishes the spiral of knowing in the classroom is - or should be - a focus on systematic inquiry and the deliberate planning of opportunities to engage in the dialogue of progressive knowledge building, in which students not only develop their understanding about particular topics but also master the modes of meaning making and genres of discourse that mediate knowing in the different disciplines.

As a result of our efforts to promote this sort of progressive dialogue, we have come to recognize the importance of having an "improvable object" as the focus of the knowledge building. This object may be a material artifact, as in the construction of functioning models made with junk materials that I witnessed in more than one DICEP classroom, or symbolic artifacts such as the recommendations as to what to do with the injured chrysalis (Chapter 1), the opposing cases made to the Supreme Court in Kowal's history class (Chapter 7), or the theory of effective class discussion being developed by Hume's students (Chapter 9). In such dialogue, contributions are made and listened to, critiqued and extended, with genuine engagement and a commitment to produce the best outcome of which the group is capable. A major focus of our current inquiries, therefore, is to discover how to generate such improvable objects in relation to the abstract topics that are specified in the official curriculum.

### **An Inquiry Approach to Curriculum**

In the social constructivist approach to education that DICEP has adopted, learning is not seen as an end in itself, nor as a separate, self-sufficient activity. Rather, it is an integral aspect of participating in a community's activities and mastering the tools and practices that enable one to do so effectively. The questions we have found ourselves needing to consider, then, are: What should be the nature of classroom activities? and To what object should they be directed?

Early in this century, Dewey offered some helpful suggestions in the context of his exposition of the curriculum for his experimental school (1900/1990, 1938). As is well known, he proposed starting with "ordinary experience," emphasizing the importance of involving students in "the formation of the purposes which direct [their] activities" (1938, p. 67) and in selecting "the kind of present experiences that live fruitfully and creatively

in future experiences" (1938, p. 28). As more recent writers in this tradition have made clear, the key characteristic of investigatory activities of this kind is that they take as their object significant and often problematic features of the students' experience and environment and have as their intended outcome a growth in the students' understanding, where this is taken to mean, not simply factual knowledge, but knowledge growing out of, and oriented to, socially relevant and productive action (Cohen, McLaughlin, & Talbert, 1993). It is not only Dewey who places inquiry at the heart of the curriculum, however. The same emphasis on firsthand investigation, both through hands-on experimentation and through the use of reference material, is found in the school-based projects of such cognitive scientists as Brown and Campione (1994), Gardner (1989), Palincsar and Magnusson (Palincsar, Magnusson, Marano, Ford, & Brown, 1998), and Scardamalia and Bereiter (Scardamalia, Bereiter, & Lamon, 1994).

In each case, a major purpose of the activities in their classroom communities is to cultivate a general stance with respect to the world of experience that might be characterized as a disposition to engage in systematic inquiry about the questions or topics in which one is interested. From this perspective, then, inquiry is as much about being open to wondering and puzzlement and trying to construct and test explanations of the phenomena that evoked those feelings as it is about mastering any particular body of information although, of course, the two facets of inquiry are ultimately interdependent.

As we have discovered, the choice of experiences that provide the topics for investigation is critical. Not only must they be such as to arouse student interest, engaging feelings and values as well as cognition; but they must also be sufficiently open-ended to allow alternative possibilities for consideration. They also need to be able to provide challenges appropriate to individual students' current abilities, while at the same time encouraging them to collaborate with others in constructing shared understanding that is both practical and theoretical. The key feature of activities of this kind, we have come to believe, is that, for the students, the goal of inquiry is *making* not learning, or, as I put it above, working on an improvable object. Motivated and challenged by real questions and problems, their attention is on making answers and solutions. Under these conditions, learning is an outcome that occurs because the making requires the student to extend his or her understanding in action - whether the artifact constructed is a material object, a demonstration, explanation, or theoretical formulation.

However, in arguing for an approach to curriculum that is organized in terms of questions for inquiry, two further points need to be made. First, for a question to be real, the student must really care about making an answer to it. However, it does not follow that the only real questions are ones that are first asked by students. Teachers' questions or questions suggested in texts that students are reading can become equally real if they correspond to an existing interest or awaken a wondering on the part of the student. What is at issue here is the student's attitude to the question, rather than where it originated; for it to motivate genuine inquiry, the question must be taken over and "owned" by the student (Van Tassell, Chapter 3). The second point is that inquiry does not have to start with a clearly formulated question. In fact, some of the most absorbing questions arise only after some preliminary work on the topic has been carried out, or as a by-product of trying to

answer some other question (Hume, Chapter 6; Scardamalia & Bereiter, 1992). They may also occur quite spontaneously and unexpectedly in the course of reviewing work carried out to date.

Over the course of our work together, we have constructed a generalized model for planning whole class units of study according to the principles just discussed. This model of an inquiry-oriented curriculum is shown in Figure 2. However, I must make it clear that this model is not to be taken as a flow diagram, prescribing the steps and their sequence to be closely followed on every occasion. Rather, it attempts to identify the key components of organized inquiry and to suggest the relationships between them. In this sense, it is a tool for thinking with rather than a blueprint for action.

The model assumes that there will be an overarching Theme or topic within which individuals or, even better, groups of students will carry out inquiries on subtopics that they wish to investigate and that can contribute to the overall theme. One of the purposes of the Launch component, with which the unit starts, is to present the theme in a way that arouses interest and provides a challenge that can be taken up in a variety of ways according to students' interests and abilities. The next two components, Research and Interpret, work together. Research is concerned with generating evidence for the chosen question through empirical investigations of various kinds and from consulting relevant sources, such as maps, photographs, historical documents, as well as encyclopedias and other works of reference. Then, in the Interpret component, the evidence is evaluated in relation to the question. It is important to emphasize that these two components stand in a reciprocal relationship to each other and to the question under investigation. Evaluating the evidence helps to clarify the question and may even lead to its revision; conversely, interpreting the evidence in the light of the question will often show that more accurate or different evidence is required in order to make progress toward an answer (see Hume, Chapter 6). Clearly, then, there may be several cycles through these two components before any conclusions can be drawn.

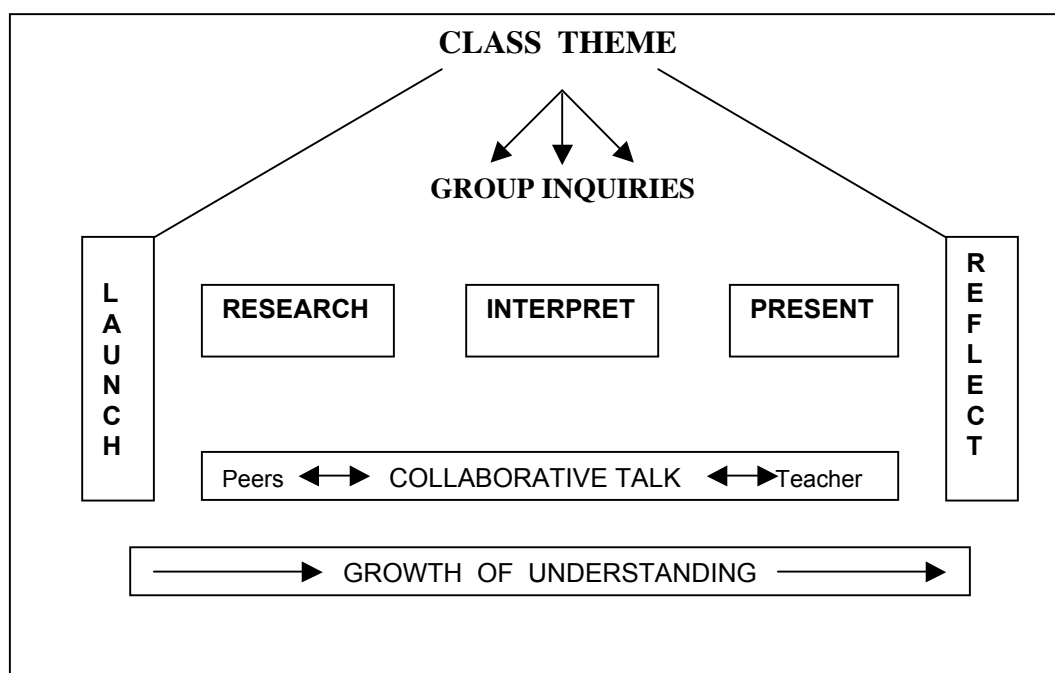


Figure 2. Model of an Inquiry Approach to Curriculum

Eventually, though, it is important to focus on the fourth component, Present. As many people have observed, there is no better way to discover how well one has understood something than by preparing to present or explain it to others who are interested but less well-informed. This requires attention both to the information to be drawn on and to its organization in terms of the appropriate genres, for example, description, explanation, evaluation (see Kowal, Chapter 7). At this stage, too, it may well be necessary to return to the research-interpret cycle in order to clarify details or to fill in gaps that have become apparent. The actual presentation to an audience serves two important purposes. First, it provides an occasion for the presenters to receive constructive feedback from peers as well as teacher. And second, it contributes to the developing understanding of the overall theme by the class as a whole. From this point of view, it is beneficial to invite interim presentations as the group inquiries proceed so that each can be enriched by the connections that are made among them in relation to the overall theme.

It is this sort of exploratory discussion that constitutes one aspect of the final component that we refer to as Reflect. As just suggested, periods for whole class reflection on progress made to date can significantly contribute to the knowledge that is constructed. But it is particularly important to engage in such reflective discussion at the end of a unit in order to make connections both within and beyond the theme, to attempt to resolve any conflicting perspectives, and to note further questions for investigation. This may also be an appropriate moment at which to consider how the knowledge constructed by the class compares to the culturally accepted version and, if there is discrepancy, to explore why this might be so. Finally, reflective discussion provides an occasion for considering the social and ecological significance of the knowledge that the class has constructed, for it is important that this be related to students' lives in the world beyond the classroom.

There is, however, a second purpose for the Reflect component, and that is to consider the processes in which the different groups have been involved. The aim here is to encourage a "meta" stance to the procedures involved in the inquiries and to the strategies that different individuals and groups have used to solve the problems they encountered. By making these matters explicit, there is an opportunity for students to learn about procedures and strategies of which they may not be aware and to add them to the tool kit of resources from which they can choose according to the demands of the particular tasks in which they are involved. This latter function of reflective discussion is particularly valuable, we have found, for the overall goal of fostering an inquiry orientation in all the activities in which the classroom community engages. This is also a feature of the classroom meetings described by Donohue (Chapter 2) and Davis (Chapter 4). Space does not allow me to include specific examples of this model in operation here, but several are included in other works (Wells, 1995, 1999).

However, the important point to make in presenting this model of learning and teaching through inquiry is that it is not a "method" of doing science, history, or any other subject, in which there is a linear sequence of stages to be traversed. Rather, it is an overall approach to the chosen themes and topics, in which the posing of real questions is positively encouraged whenever they occur and by whoever they are asked. Equally important as the hallmark of an inquiry approach is that all tentative answers are taken seriously and are explored as rigorously as the circumstances permit. Thus, inquiry should not be thought of as an approach to be adopted in occasional activities or in a single curriculum area. Although it may not always be possible to approach a curricular unit in the way suggested by the model, the aim should be to foster an inquiring disposition that influences the way in which all activities are approached and that is generative in the formation of students' identities. For this to happen, we believe, inquiry must become a central feature of classroom life. The class needs to become a community of inquiry (Wells, 2002).

How this is to be achieved, however, is not self-evident. Nor is there likely to be one single best way to proceed since, as emphasized earlier, each classroom consists of a unique collection of individuals, each with their personal experiential histories, current interests, and knowledgeable skills. We have found that holding regular class meetings in which the life and work of the class are open for discussion (see Chapters 2 and 4) can play a significant role in this respect. We have also found some helpful pointers in the university-inspired initiatives mentioned above and in the increasing number of inquiries carried out by teacher researchers (Atwell, 1991; Gallas, 1994; Norman, 1992; Short & Burke, 1991; Wells et al., 1994). But, ultimately, each teacher has to discover how to proceed in his or her own specific situation and in collaboration with the students with whom he or she is working. It is for this reason that teachers themselves need to become inquirers, carrying out research in and about their individual classroom communities.

### **Teachers as Researchers**

There are, in fact, two important reasons for teachers to become inquirers in their classrooms. The first is to act as models of the inquiring stance that they wish their students to adopt. It is rare that a teacher fully understands every aspect of the topics and issues that make up the mandated curriculum that they are required to teach. This may not become apparent if one sticks closely to the textbook or suggested lesson plans. But once one encourages students to make connections between the curricular material and their own experiences, one quickly finds that they ask questions to which one does not have ready answers. In this situation, it may be tempting to acknowledge the interest of the question but to argue that there is not time to consider it or that it is not really relevant. However, such moments can be opportunities not only to learn more about students' interests and experiences but also to consider how one might set about answering the question and perhaps embarking on a joint investigation to do so.

One such occasion arose in a grade six class in which I was co-teaching a unit on time. Groups of students had been trying to establish which of the variables – length of a pendulum, weight of the bob, or angle of release – affected the pendulum's rate of swing.

One group that was adding additional metal washers to the bob and systematically recording the results demonstrated to the class that adding weight made the pendulum swing more slowly. The first reaction was to dismiss the results as “error of measurement” since, as teachers, we knew that it is only the length of the pendulum that controls the rate of swing. Instead, we treated this as a real “finding” and encouraged the students to continue their investigation, taking into account the fact that another group had found that adding weight did *not* make a difference. The next day, the group returned with an explanation that they duly demonstrated: with their initial pendulum made of string, adding weight caused the string to stretch and, because the pendulum thus became longer, it did swing more slowly. However, when they used wire instead of string, adding weight did not affect the rate of swing. By their being encouraged to puzzle over and try to explain their “aberrant” results, everyone in the class came to understand the functioning of a pendulum more fully than they might otherwise have done.

From an even more challenging starting point, Karen Hume (Chapter 9) described how, responding to one student’s critical question about the value of whole-class discussion, she became involved in an inquiry with this student and a group of his peers that led to the recording and analysis of several class discussions and to a similar analysis of the group’s own investigatory discussions. As she reported, this student-initiated investigation proved very worthwhile and led to increased understanding, on all their parts, of why and how to improve their whole class discussions.

The second reason for conducting teacher research has already been mentioned. While there are no universally valid “best” ways to teach, nevertheless by systematically investigating one’s own practice, one can find out what approaches, choice of activities and patterns of organization are most successful in one’s own particular situation and, as a result, improve both one’s pedagogical understanding and one’s practice. All teachers engage in this sort of reflection on their practice to some extent as they try to be more successful in helping their students to learn. What makes teacher researchers different is that they adopt a more systematic approach to reflective practice. Choosing some particular issue that they find problematic, they deliberately collect evidence that bears on the issue - observations, students’ work, and so on - and use it to try to make sense of their initial puzzlement and, as a result, to make plans to change their practice accordingly. Judith Newman (1978) suggests that a good place to start is with events that “challenge one’s assumptions,” since examining the fit (or lack of fit) between assumptions and evidence can often lead to a much deeper understanding of what one had previously taken for granted. This was what happened when Hume’s student questioned the value of class discussion and she and her student co-investigators made this a topic for systematic research.

### **Building Communities of Inquiry**

All the members of DICEP had been engaging individually in teacher research before the group was formed. However, what we found was that, as anticipated, meeting and working together as a group with similar concerns both provided for each of us supportive others with whom to share our common interests and concerns; it also

enabled us to be more effective as action researchers. Quite quickly, our overriding aim became clear: to collaborate in coming to understand, in practice and in theory, how to create and sustain communities of inquiry, in which all concerned learn with and from each other about matters of individual and social significance through the dialogue of knowledge building.

It would be misleading, however, to suggest that collaborative action research is straightforward and free of tensions (Newman, 1998). In DICEP, our attempts at collective planning and decision making were not always easy, and there were occasions when we had difficulty in agreeing on a common topic for our research. However, two actions taken early in the project were important, in more than symbolic ways, in establishing this new form of school-university collaboration. The first was the decision to have a rotating chairperson for our monthly meetings, with the agenda for each meeting being constructed by the incoming chair on the basis of proposals received from all members of the group. The second was the choice of a new name for the project, voted on after an extended process of discussion in meetings and via our e-mail network. The name finally chosen, *Developing Inquiring Communities in Education Project*, made clear the breadth of our concerns. It also emphasized our conviction that inquiry was not only relevant to learning in schools; it applied equally to university classrooms, to preservice and in-service teacher development and, most important, to the work of our own group. In the chapters that make up the book, there are references to the ways in which we have benefited from occasions of collaborative knowledge building within our community, including informal discussions immediately following a classroom event, collaborative interpretations of videotaped episodes, responses to individual reports of work-in-progress presented at our monthly meetings, joint preparation of conference presentations, coauthoring of papers for publication, as well as the ongoing dialogue via e-mail.

At this point, therefore, it might be helpful to describe in more detail the way in which one of our group investigations was chosen, taken up in individual inquiries, and explored collaboratively within the group. In order to construct this account, I went back and reviewed the minutes of our monthly meetings, transcripts of recordings of two of our meetings, and the e-mail discussion that took place around the theme chosen for investigation - in all, several hundred pages of data. Where I have included verbatim quotations from this material, I have used pseudonyms for the contributors.

### **Tracking the Development of a Group Investigation**

At our meeting in June 1995, after a year in which we had pursued "individual inquiries with mutual support," it was proposed that, in the coming year, we should work on a shared topic. The minutes note that this proposal received enthusiastic endorsement by the group, and there was considerable interest in exploring "journal writing." By the September meeting, however, the enthusiasm for focusing on journals had abated considerably, and we were unable to agree on a common focus.

Then, starting on the evening of the meeting and continuing over the following weeks, a vigorous discussion ensued in the medium of e-mail. The initial contributions reemphasized the desire to find a common focus:

I think that our individual inquiries have been great, but there were many times last year when I really wished that we could discuss issues in more depth-both personally and via e-mail. While we are all well-read, thoughtful individuals and we contribute a great deal to each other's inquiries, I think there's a power to collaborative work that we haven't even begun to explore. . . . Is there a way that we can come up with a topic that is broad enough to include everyone's interests, but specific enough to allow us to: make our research plans together, discuss details, share theoretical literature, and maybe come up with some group findings? (Martha, 21 Sept.)

I support Linda's argument that whatever we do should tie into our present experiences and be of benefit to the students that we teach and to our own personal inquiries. I like the idea of using DICEP to further the students' learning by sharing with them the observations and comments we generate from samples of their work. (Bill, 22 Sept.)

. . . the theme of "Learning through Writing" and also the aspect of community. I, too, would like to explore the possibilities of "homing in" on this theme and finding some ways to collaborate as a team and do some "knowledge building" together. (Veronica, 22 Sept.)

A few days later, the discussion was significantly advanced by a two-part message from Linda, a teacher in an inner-city school. In the first part, she suggested we consider two specific questions and added her reasons for proposing them:

1. How is writing (or written discourse as some might wish to frame it) used as a tool for learning and/ or thinking and/ or understanding and/ or social action in each of our classroom communities?
2. How would or could I systematically conduct an inquiry on an aspect of whatever my answer is to question 1?

I feel that if our contributions are to be significant, one aspect of our efforts could be reconceptualizing & reseeing practices and theory. Individually and as a group we are not only committed but thoughtful educators. What emerges from our responses to the two questions and the process will be, I bet, exciting because we have some very exciting & significant practices going on in all our classrooms as well as common patterns & trends because we share common learning-teaching beliefs & theories. Our practice is theory in action, and this will enable us to strike & identify common "plans." Last but not least, this process will enable our "plans" to emerge and be rooted in practice which in turn is subjected to joint inquiry, conversations & reflections. (27 Sept.)

In the second part, Linda described an event in her Grade 6/7 class that illustrated her suggestion:

I have noticed that [in class discussions] it was often the same few [students] who would participate enthusiastically while the rest sat & listened. Yet inside me I know that there is the possibility that the latter have things to say. . . . I conjectured that perhaps if writing is used as a tool for what I call "rehearsal thinking," would our oral discourse be one in which more will participate as well as more substantive? My conjecture, in part, is due to my beliefs in the value of writing and, in part, to experiences as a teacher & learner. So I decided to use writing as a tool for individual thinking before embarking on a class discussion. I asked my students to complete the following prompt "Science is . . . ." in their learning logs. I also informed them that they would be asked to read what they wrote to the rest of the class.. After hearing everybody's responses they would have the opportunity to add two sentences to their original responses.

The consequences were amazing. First the pool of ideas surprised me. They reflected some very solid understanding of what science is or is not but more significantly the follow-up discussion had everyone participating. They were responding to each other, debating & offering counter arguments or examples. The level of our oral discourse was indeed sophisticated verging on philosophical, for example, Marta asked, "Is language science?" What do I make out of all this?

It also provided the less confident, like some of my ESL kids, a chance to "see their own thinking" & therefore feel more confident in being able to "read out their thoughts" rather than having to respond not only spontaneously but at the turn-taking speed of oral discourse. Another is that writing slowed down one's thinking, making it more deliberate & intentional allowing one the "space" to be more thoughtful, making one's thinking visible for review & changes.

Very significantly, writing provided everyone a "same-time" turn & therefore increased dramatically the pool of knowledge which linear turn-taking in oral discourse does not. Also, my intention behind the provision of the opportunity to add two more sentences to one's own ideas, having-heard from others, is to model the recognition of how our knowledge is often coconstructed & that this is in fact valuable. (27 Sept.)

This example met with an enthusiastic reception. Consequently, building on the various suggestions that had been made, I prepared a first draft of an approach we might take to the two questions that Linda had proposed. This plan was sketched in very general terms so that it could be included in members' individual inquiries. At the same time, it indicated a focus on writing, not as finished product, but as a tool to be used in some superordinate activity. It also indicated an expectation that action and talk would be intimately connected to the written text.

The plan was approved at the October meeting, and individual members outlined the ways in which they intended to put it into effect in the contexts of their programs. Space does not allow me to describe in detail any of the very interesting projects that were carried out under this umbrella research theme (but see Hume, Chapter 6, and Haneda & Wells, 2000, for some examples). They included writing in activities related to literature, math, science, and history; writing carried out collaboratively as well as solo; and writing on Post-it notes, in the form of webs and charts, as well as in logbooks.

Over the next few months, a major part of each of our monthly meetings was given over to individual members presenting reports on their investigations, often including video clips, examples of students' writing, and transcripts of extracts from discussion. In turn, these provoked wide-ranging discussion in our group, in which important insights were gained about the relationships between action, talk, and text, and connections were made to related activities in our different classrooms. For example, a presentation at the December meeting had included a description of how students were responding to a story read aloud, in writing and in discussion, using the cues 'retell, relate, and reflect' (Schwartz & Bone, 1995). The discussion that followed produced this insight on the role of the teacher in responding to contributions to classroom discussion:

You have this high incidence of "reflecting" and "relating" in your oral discussion. I think it is [specific to] your class, because I don't think it's a given that that will happen in any class, because your key word. . .-you say to them "Some of you might have some thoughts about that." You use the word "thoughts" and everybody starts to say "I think." That's a very powerful suggestion, because when you give that prompt, you're actually scaffolding them and engaging priorities, whereas if I were a teacher who never used that kind of prompt, then I think the children would be operating at a very different level. Whereas in writing, they do not have that sort of scaffolding. They're on their own. So it's only over time that they engage a lot of higher order thinking in the oral mode and only slowly that it comes across in writing. So I think the role of the teacher talking, her role leads to a lot of reflection and the children being able to relate to it. (Linda, 4 Dec.)

In the same meeting, the issue of the tendency for the teacher to act as the hub in discussion - both nominating speakers and providing a followup to their contributions - surfaced as one that needed to be made the subject of future action research. In fact, this became a central theme for Zoe Donoahue's inquiry (Donoahue, 1998). It also became a focus for systematic analysis of the discourse data collected across all members' classrooms (Nassaji & Wells, 2000). As is apparent, the decision to adopt a common theme had valuable consequences for the group as a whole, as well as for individual members.

## **Constructing a Common Framework for Inquiry**

In much policy-based discussion of teaching, it is common to talk about practice being driven by theory. What is envisaged is a hierarchical relationship, in which experts outside the classroom develop the theory, which is then formulated as recommendations that teachers are expected or required to implement. However, this view of the relationship is neither appropriate nor desirable (Stenhouse, 1975) and the history of reform efforts has shown it to be quite unrealistic (Fullan, 1992). One reason for this is that every classroom is unique in respect to the persons it brings together, the resources available to them, and the constraints under which they operate. This means that any theory of pedagogy or curriculum necessarily has to be adapted and modified according to local conditions.

There is, however, a much more fundamental reason for the failure of top-down reform, namely, that the relationship between academic theory and the practice of teaching is much less direct than the implementation model implies. The theory that guides teachers' practice is typically based much more on personal practical knowledge (Connelly & Clandinin, 1985) and on professional wisdom than on the findings of university- or policy-based research. It is also heavily imbued with values and is integral to a teacher's personal identity. Although the theory may be tacit rather than explicitly formulated, it nevertheless influences what aspects of classroom life a teacher treats as most important and provides her or him with a point of reference in decision making and problem solving. For this reason, we refer to this practice-based orientation as the teacher's vision. If educational theory is to have an impact on practice, it must enter into discourse with individual teachers' visions, as it is this vision that guides their daily practice.

However, a further problem lies in the traditional assumption that the relationship between theory and practice is unidirectional. In our view, theory should not only seek to influence practice, it should also grow out of and be informed by practice. One way in which this can happen is through critical investigations of the relationship between vision and practice carried out by practitioners in their own classrooms. In this sort of investigation, it is not theoretical generalization that is the principal object in view, but rather an improved enactment of vision in practice and an increased understanding of the ends and means of education, as these are realized in the particular conditions of the teachers' own classrooms. In this context - as we have found - theory is most useful as a set of tools for systematically describing and interpreting the data derived from observations of practice.

These, then, are the four components of our conceptual model: vision, practice, theory, and data. The following paragraphs spell out in more detail the ways in which we have put them together to describe our conception of educational action research.

*Vision.* Although we might each express them somewhat differently, the goals at which the members of DICEP aim include:

- Creating communities characterized by inclusiveness, equity, and caring, as well as by intellectual achievement;
- Giving a high priority to knowledge building and understanding through inquiry, while not neglecting the routine processes and skills needed to engage in them;
- Encouraging collaboration between teacher and students, as well as among students - valuing and building, whenever possible, on students' contributions to the activity in progress, so that knowledge is coconstructed, rather than unilaterally delivered;
- Broadening interests and recognizing and valuing the contributions of experts beyond the classroom-bringing the classroom community into a two-way relationship with communities beyond the classroom (local/worldwide, practical/intellectual) by participating in their practices;
- Acknowledging and taking into account that, whatever the activity, the whole person is always involved (body, mind, feelings, values);
- Providing for the growth and self-determination of each individual as well as for the development of the classroom community as a whole.

*Practice.* While we can work toward agreement about the vision, we necessarily differ with respect to the specifics of practice because of the unique combination of participants and conditions with which we each work. This highlights the crucial difference between vision and practice. Vision is essentially abstract and synoptic; practice is dynamic, realized in the successive decisions and actions of unique individuals and communities in relation to the possibilities and constraints of their specific material, social, and intellectual environments. Although there is clearly a relationship between vision and practice, it is not a simple one, such as is suggested by the term implementation. However, it is toward understanding this relationship, as well as toward optimizing the learning opportunities created in practice, that our individual and collaborative inquiries are directed.

*Theory.* Theory can be looked at in two ways. On the one hand, a theory is an artifact created in the process of knowledge building in collaboration with others, including thinkers of the past whose ideas live on in their writings. From this perspective, it is produced in, and is the outcome of, attempting to make sense of the diversity of one's own and other people's particular dynamic experiences with the help of a model that attempts to explain by reference to more general categories and relationships. On the other hand, a theory is a tool for use in action. From this perspective, it is only valuable to the extent that it enables us to better understand and plan for the situations we find ourselves in so that we are able to act more effectively. As a tool, it has two functions. First, it provides a systematic means for interpreting the data derived through observation of practice and through the collection of related artifacts of various kinds. And second, the theories we construct in collaboration with others give greater explicitness and coherence to the personal visions that guide our practice. Furthermore, theories are improvable objects, and as educators, we are committed to improving the theories that we use to interpret and evaluate our practice as well as the practice itself.

*Data.* Like theory, data are also artifacts; they are outcomes of specific activities that, deliberately collected, represent some aspect(s) of those activities. They are thus evidence of the nature of practice. Their value lies in the fact that, like written texts, they continue to exist after the activity is over and can therefore be revisited and analyzed from perspectives derived from theory. In our case, the data we have collected consist of videotapes of classroom activities, written texts of various kinds, interviews, e-mail discussions, and tape recordings of parts of our meetings. Data stand to theory rather as practice stands to vision. Where vision and theory tend to be abstract and general, practice and data are specific and dynamic. However, there is another way of considering them: theory and data, considered as a functional system, can be thought of together as a tool that mediates understanding of the relationship between vision and practice. That is to say, by using theory to analyze and interpret the data we collect in our inquiries, we are able to evaluate how far our practice matches our vision and, on that basis, to plan necessary changes; at the same time, the increased understanding achieved leads to clarification and enrichment of the vision.

Spelling out this conceptual model gives substance to the procedural model of action research proposed in earlier work (Carr & Kemmis, 1983; Wells, 1994) inasmuch as the four components just described map directly onto the four "moments" in the cycle of action research: *plan, act, observe, interpret*. At the heart of the resulting framework is individual and collective *understanding*, where understanding is construed as "knowing that is oriented to action of personal and social significance and to the continual enriching of the framework within which future experience will be interpreted" (Wells, 1999). These relationships are represented in Figure 3.

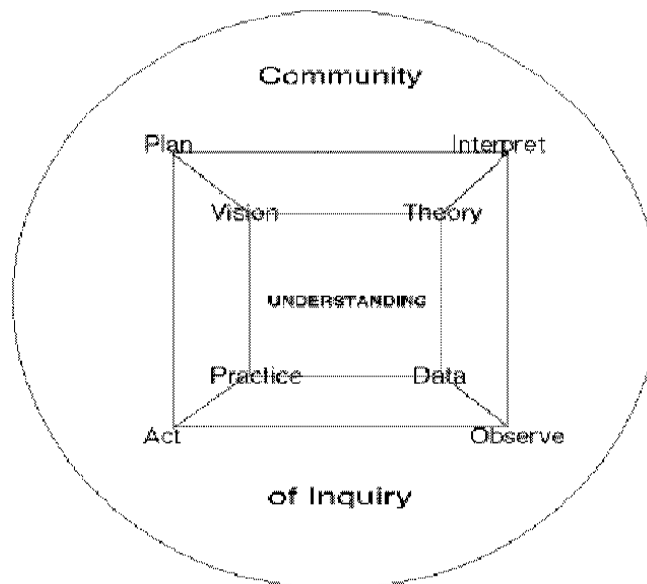


Figure 1. Model of Action Research

One of the strengths of this overall framework, we believe, is that it was constructed on the basis of what the DICEP group was already doing. In that sense, it is theory growing out of practice and, at the same time, illuminating practice. Maria Kowal, who was not able to take part in the original discussion, subsequently commented as follows:

For me, as well as being descriptive of our actions and way of looking at research, [the model] enriches the notion of teacher researcher. Many others have described action research cycles (e.g., Lewin, Kemmis and Carr, McNiff) but the components - vision, practice, theory, data - show that the teacher-researcher is not just following the action research cycle but is a contextualized individual, with a belief system which influences the action research cycles. S/he is contributing to and constructing theory, based on practice and the data collected. For me, this is a much richer construct of the teacher-researcher, and more accurate of what we have experienced. I think too, that in terms of "research" in general, it adds more legitimacy to the notion of teacher-researcher. (e-mail, 26 Jan. 2000)

An important feature of the model of action research is that the relationships it represents are not unidirectional. As several authors in this volume note, investigations of practice can lead to clarifications and enrichments of vision, and analyses of data can lead to development and/ or modifications of the theory, as well as vice versa. In this way, the model rejects the traditional direct hierarchical relationship between theory and practice by substituting one that more adequately captures the complex dialectic among the four components and that better expresses the ethos of collaborative knowledge building that characterizes educational action research carried out in communities of inquiry. Equally important, each individual member decides both on what question to investigate and on where to enter the cycle.

Our hope is that, by sharing the framework that we have constructed for our research as well as by presenting some of the results of our inquiries, we can contribute to the dialogue among educators about how best to achieve their vision in an effective and responsible manner. At the same time, we hope that this collection of reports of teachers' action research will open up a more productive interchange between educational practitioners and those who have the responsibility for setting educational policy and overseeing its enactment.

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