

Expertise in Teaching from a Developmental Perspective: The Developmental Teacher Education Program at Berkeley

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Abstract:

Expertise in teaching is considered from a constructivist developmental perspective that has been applied both to the teaching of elementary school children and to the preparation of teachers in a two-year graduate program at the University of California at Berkeley. The program's goals and practices are discussed with reference to developmental principles which hold that understandings are constructed *gradually*, through the learner's own *activity*, within different knowledge *domains*. Evidence of the program's effectiveness in promoting expertise among student teachers and graduates is summarized in terms of a developmental sequence that teachers appear to go through in attaining constructivist understandings in the domain of pedagogy.

Article:

The Developmental Teacher Education Program at Berkeley (DTE) is a small graduate program leading to the Multiple Subject Credential (for teaching at the elementary level) and the M.A. in Education. Throughout their four semesters in the program, students are engaged concurrently in student teaching at a variety of placements and in coursework that emphasizes the study of development as core knowledge for teaching. The program represents a concerted effort to prepare teachers in a way that will enable them to become true experts in good time once they begin their careers in teaching (Ammon 1984; Black 1989; Black & Ammon 1992). In this article we outline the view of expertise in teaching that underlies the DTE program, and we discuss its implications for the kinds of goals and practices the program pursues. We also look at some of the outcomes that have been observed with respect to DTE students and graduates during the ten-year history of the program.

From a purely functional standpoint, expertise in teaching can be defined as effectiveness in bringing about desired learning outcomes in students. If nothing else, this definition at least has the virtue of leading us to ask what *kinds* of outcomes are desired. There has been a longstanding tendency in education to answer this question in quantitative terms: the more students learn, the more desirable it is, and the more effective their teachers have been. Now there seems to be a growing consensus among educators that the emphasis must be shifted somewhat from quantity to quality. Good understandings of subject matter are seen as particularly desirable outcomes of instruction, and effective "teaching for understanding" is therefore a mark of expertise in teaching.

What is it, then, that enables teachers to be "experts" by the criterion of teaching effectively for understanding? Just as student learning is often evaluated in terms of quantity, there is a common assumption that expertise in teaching is quantitative in nature as well: expert teachers know *more* about their work than others do. While quantity is undoubtedly important, it also seems arguable that quality is important here too that teaching *for* understanding implies teaching *with* understanding. Expert teachers have better understandings to draw upon—better ways of thinking about their work.

What is it, then, that teachers need to understand particularly well in order to be experts? Here we must acknowledge, again, that quantity does matter in some respects. There are probably *many* kinds of understandings that are required for true expertise in teaching. They include understandings about subject matter, about interpersonal relations, and about moral and societal issues involved in teaching. Most central and unique to teaching, however, are understandings about *pedagogy*—*about* what is involved in helping someone learn, especially with understanding. What we have in mind is not simply knowing a lot of teaching methods that promote understanding, but knowing *why* they work when they do, and why they don't when they don't. Just as pedagogical understandings are central to teaching, so too must they be a central concern of teacher education, because good understandings in this domain cannot be taken for granted. From the standpoint of everyday life, teaching is, in some respects, an "unnatural act"—even "expert" teaching. *Especially* expert teaching!

If we approach teacher education as a matter of preparing teachers with the kinds of pedagogical understandings they will need in order to teach *for* understanding, then we had better operate from some well founded theory about how understandings are attained. In the case of the DTE program, that theory is the kind of constructivist developmental theory associated most generally with Piaget (e.g., 1970). It is a theory that rests on three basic principles:

1. Understandings are constructed *gradually*, both in the sense of taking some considerable time, and in the sense of evolving through gradations, or *stages*. Stage theories have always been controversial, and lately they seem to have been downright unpopular. But bear with us: what we have in mind is consistent with such everyday remarks as, "I understand that better now," and "You and I seem to have different understandings about this."
2. Understandings are constructed through one's *own activity*. No one else can understand something *for* you: they can *help* you understand, but ultimately you have to "get it" yourself. For a number of reasons, the particular activities that lead to particular understandings may vary considerably from one person to another, e.g., some people prefer to draw or manipulate, others like to write or engage in conversation, etc.
3. Understandings are constructed within various *domains*. That is, our understandings are about different kinds of things—the physical world, the social world, number, written language, and so on. Consequently there must be stages of understanding that are domain-specific (see, e.g., Turiel & Davidson 1986).

Taken together, these principles represent both the kind of understanding we want *teachers* to attain with regard to pedagogy, and the kind of understanding that guides *us* in our efforts to help them get there. (For a similar view of teaching and teacher education, see Fosnot 1989.)

The principles of constructivism provide a basis for a more elaborated definition of expertise in teaching. It comes in three parts: An expert teacher (1) has well developed constructivist understandings of pedagogy, and (2) the ability to act upon them in teaching, (3) with consistency, in different domains and with different learners. The first part of this definition follows directly from the preceding discussion. The second part covers a whole host of things that cannot be enumerated here, except to say that it includes all the information and skills and understandings in domains other than pedagogy that enable teachers to put their pedagogical understandings to good use. Because the particulars must vary somewhat with the individual teacher's circumstances, this is where expertise in teaching becomes "situated" (Brown, Collins, & Duguid 1989). Finally, the third part of the definition is really an elaboration of the second. It is there to convey our concern that teachers have breadth as well as depth, both in their ability to teach across knowledge domains, and in their ability to appreciate individual differences, including those associated with diverse cultures.

This elaborated definition of expertise in teaching, together with the principles of constructivism, has a number of implications for what we do in the DTE program. We will discuss them here, all too briefly, in relation to each of the three constructivist principles. In accord with the principle of *gradual construction*, the goal of our preservice program is not that students should attain expertise by graduation, but rather that they should get a good start in developing constructivist understandings of pedagogy, and a good foundation for further growth beyond graduation. High-level expertise in teaching is almost certainly unattainable during the preservice period, for a number of reasons, including the situated nature of expertise mentioned above. And, while we want teachers to make timely progress toward expertise, we are also mindful of Piaget's admonitions on what he called the "American question" regarding the possibility of accelerating development, when he suggested that faster does not necessarily imply farther.

Even with the more modest goals we have set for the DTE program, it still is important that the preservice period have sufficient duration to make them attainable. Two years may not seem like a very long time to prepare for elementary teaching, and it isn't. But it certainly compares favorably to the one-year, post-baccalaureate programs that are still typical in California. Having some additional time not only opens up the possibility of studying development much more intensively than usual, but it also means that basic issues regarding development and teaching can be addressed *recursively* as students progress through the program. To give just one example, the DTE curriculum includes coursework in the teaching of math, science, and reading during the *first* year of the program, and then does so again during the second year. Thus, students have opportunities to revisit issues and rework their understandings at more advanced levels while they are still preservice teachers.

It is also consistent with the principle of gradual construction (and with the principle of *active construction*) to give preservice teachers ample opportunity to think about teaching from their own current perspectives, instead of force feeding them with more advanced perspectives. On the other hand, there are also ways in which DTE attempts more directly to facilitate progress toward more advanced levels of understanding, through instruction that is geared to the students' current levels. We will have more to say about that below.

With regard to the principle of *active construction*, an important elaboration of this principle is that it implies not just "doing," but "doing and thinking," or "action and reflection," as it is sometimes put. In their student teaching, DTE students do a great deal of trying out and evaluating, and their self-evaluations—which are often written in their weekly journals—are aimed at understanding not just what worked and what didn't, but also *why*. Another way of expressing "action and reflection" is in terms of "making choices and giving reasons." In their very first assignment in the program, DTE students are asked to choose some of Piaget's classic tasks, to carry out some clinical interviews based on them with children, and to write a paper reporting and interpreting their findings in relation to Piagetian theory. This assignment entails explaining why they did what they did, and why they concluded what they concluded. Another assignment, in the final semester, asks the students, as a group, to produce a document which describes and explains a developmental approach to K-6 reading and writing instruction. Both in negotiating the form and content of the document with each other, and in addressing their readers, the students are engaged in making a lot of choices and giving a lot of reasons. (This assignment and many other activities in DTE benefit from the program's small size; about 20 new students are admitted each year.)

The principle that understandings develop within particular *domains*, together with the proposition that teachers need to have good understandings in a *variety* of domains, raises an interesting question about a program like DTE. Could a program that puts such a heavy emphasis on the development of understandings in the domain of pedagogy thereby run the risk of becoming one-dimensional, through its neglect of other relevant domains? A closer look at what happens in the DTE program suggests that there is actually more attention to other domains than might at first meet the eye. For one thing, the integration of developmental theory with issues about teaching in each of the various elementary school content domains may have the result that teachers attain better understandings of the content in each of those domains. That is, in trying to understand how children think about number, for example, and how that differs from their own ways of thinking, teachers probably end up not

only with new understandings about children, but also with their own new understandings about number. Similarly, when DTE students are engaged in problem solving with regard to some of the real-life dilemmas of teaching, it generally means that they are dealing with "mixed-domain" situations (Duncan 1986) which require the coordination of several sorts of considerations at once, including moral, societal, and interpersonal ones, as well as those that are strictly pedagogical. Questions of educational equity, for example, involve all of those domains. It still remains to be seen whether these aspects of DTE actually do promote teacher development in domains other than pedagogy, as hypothesized here, but it seems at least plausible that they do.

Returning now to DTE's focus on the domain of pedagogy, we said earlier that, in principle, efforts to promote better understandings of pedagogy should include instruction that is geared to preservice teachers' current levels of understanding. Putting this principle into systematic practice requires that we have some understanding, ourselves, as to what the levels of development in pedagogical understanding are. Therefore we have begun to articulate a theoretical model of developmental levels in pedagogical thinking, and to study the progress of DTE students in relation to the model (Ammon & Hutcheson 1989). It is a difficult model to discuss with any brevity, because it consists of 5 developmental levels that describe changing conceptions in 4 related areas—child behavior, development, learning, and teaching—and each cell in this 4 × 5 matrix requires about a page of description. However, a highly abbreviated representation of the model is shown in Table 1, which contains a name for each level along with conceptions about learning and teaching that distinguish each level from the others. In keeping with constructivist developmental theory, it is assumed in the model that each succeeding level represents a more adequate way of thinking about pedagogy, and that each level incorporates and builds upon aspects of the level before it (Hutcheson & Ammon 1987). The question of interest, then, is how these hypothesized levels are taken into account by DTE's instructional program.

TABLE 1.
Levels of Pedagogical Conception.

<i>Qualitative Level</i>	<i>Learning Comes from:</i>	<i>Teaching is Essentially:</i>
1. Naive Empiricism	Experiencing	Showing and telling
2. Everyday Behaviorism	Doing (i.e., practicing)	Modeling and reinforcing
3. Global Constructivism	Exploring	Providing hands-on experience
4. Differentiated Constructivism	Sense making	Guiding thinking within domains
5. Integrated Constructivism	Problem solving	Guiding thinking across domains

Although the basic sequence of DTE's curriculum was already in place before we began studying teacher development, it turns out that the sequence does make sense in light of what we are now beginning to learn about the development of pedagogical conceptions among our students. It appears that most students enter the program thinking largely at level 2, but also feeling some need to go beyond the sort of everyday behaviorism that level 2 entails (which may be why some of them enrolled in the program). The program's core seminar begins, then, with a graduate-level introduction to Piaget's general theory of development, which provides students with some ideas that do go beyond behaviorism, but which they seem to assimilate initially in ways that are quite monolithic and global, even though more differentiated constructivist ideas (like the concept of development within domains) are made available to them early on. The global version of constructivism seems to persist in students' thinking into the second year of the program, when the core seminar turns to more intensive examinations of child development in each of the principal domains covered by the elementary school curriculum. Even then, some students may still think of constructivism in relatively global terms, but others at least begin to show the kinds of differentiations in their thinking that are emphasized in their second-year coursework.

Although we have already seen that the DTE curriculum is sometimes assimilated by students in their own ways, the parallels that occur between the curriculum and the development of teacher thinking nonetheless raise an obvious question: Is the developmental sequence we see in our students' thinking mainly an artifact of the curriculum sequence? It is not an easy question to address empirically, because it is not easy to find the

development of constructivist understandings independent of support for them through instruction. However, two kinds of exploratory studies have been undertaken recently, and the preliminary results seem promising. One type of study looks at the development of teachers enrolled in programs that are similar to DTE in basic philosophy, but different in curriculum (Kroll 1991). The other type looks at the further development of DTE graduates, when they are no longer enrolled in the program (Levin & Ammon 1992). To the extent that we have looked at data on teacher change from these studies, they seem consistent with the five-level model.

While not surprising, it is nonetheless noteworthy too, that there *are* individual differences among DTE students in the rate and extent of their conceptual progress as they go through the same curriculum. It suggests, again, that the students are not simply mirroring the curriculum, step by step, and it also raises the question of how instruction in DTE can be individualized to take such differences into account. There are many opportunities for individualized instruction in the interactions that preservice teachers have with their supervisors, and in the feedback they get on their academic work. This sort of individual attention has always been an important feature of DTE, but we have just begun to connect it explicitly with our model of development.

Finally, with regard to the question of program outcomes, we have already started discussing them with reference to the evidence of development in the pedagogical understandings of DTE students and graduates, and we will discuss that evidence further here. Except for questionnaire surveys of DTE students and their eventual employers (which indicate reasonably high levels of satisfaction with the program and with its graduates) we do not have "large-scale" data on outcomes. However, along with a good deal of informal observation, we do have pilot data and case studies on the conceptual development and teaching practices of teachers who have gone through the program. Since much of that has already been reported at AERA over the last few years, I will simply review it here.

First, we have seen evidence of development in pedagogical understandings between entry into and graduation from the program. It is important to note that this evidence comes not from papers that students wrote for courses on development and education, but from interviews (Ammon, Hutcheson, & Black 1985; Levin & Ammon 1992) and journal writings (Hutcheson & Ammon 1986) in which students were encouraged to express their own views on teaching and on their experiences in classrooms.

Second, in research by Kroll and Black (1987, 1989), it was found that DTE graduates made greater use of constructivist teaching practices than other, highly experienced and well regarded teachers. In general, the DTE graduates gave their own students more opportunities to make choices and give reasons, to try out and evaluate, and to act and reflect.

Third, we have recently found evidence that DTE graduates continue to grow in their pedagogical understandings during their first few inservice years (Levin & Ammon 1992). Even in just their third year of teaching, some seem to have reached high-level expertise with regard to their understandings of pedagogy. Thus there is reason to believe that DTE is attaining its goal of giving teachers a good start and a foundation for further growth.

Of course the ultimate criterion of success is the extent to which DTE graduates are effective in teaching for understanding in their work with their own students. We have not yet attempted a systematic assessment of learning among the students our graduates teach, but that is, after all, the "bottom line." Nor have we done the kind of comparative research that would enable the program to determine whether it deserves any particular credit for the successes its graduates may have achieved by any of the relevant criteria. There are grounds for skepticism in that regard, too, because we have had the pleasure of working with students who were very talented to begin with, and who may have become expert teachers by some other route anyway. On the other hand, it is also possible that the program may have helped them, which is what they generally report. In any case, it should be clear that we still have a lot to learn, and to understand better, about expertise in teaching from a developmental perspective.

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