

Some Surprising Findings on How Teachers Learn to Teach

What do teachers learn about teaching strategies from different kinds of teacher education programs? The TELT Study was an in-depth effort to find out.

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What teachers actually learn from different kinds of teacher education programs has been the focus of a large scale study at the National Center for Research on Teacher Learning. Known as the Teacher Education and Learning to Teach (TELT) study, this project examined not only preservice and inservice programs, but also induction programs and alternative routes.

In each of the programs we studied, we selected a sample of candidates who were just entering the program, and followed them through the program and into their first year of teaching on their own. Altogether, the study included more than 700 teachers and teacher candidates, each of whom was questioned on at least two occasions and sometimes on as many as five occasions.

Of particular interest to us was what teachers learned about teaching and learning from their different teacher education programs. The reform movement in American education is becoming more and more directed toward giving students deeper understanding of subject matter and greater facility with reasoning as well as finding ways to engage all children with



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important academic content. While these ideas sound good in the reports of blue-ribbon commissions, they raise difficult questions about what teachers need to know about subject matter and students, and they raise difficult questions about how teachers can learn these things. Thus, as we examined our programs, we were particularly interested in seeing what teachers learned about teaching academic subject matter to diverse students.

Subject Matter Knowledge

One thing we have learned is that majoring in an academic subject in college does not guarantee that teachers will have the kind of subject matter

knowledge they need for teaching. When we contrast teachers who majored in a subject with others who did not, we find that the majors are often no more able than other teachers to explain fundamental concepts in their discipline. This is probably the most surprising finding from the study, and one that seems counterintuitive.

It is so taken for granted that courses in a subject increase one's knowledge of that subject that many people think the number of college courses taken is a measure of knowledge itself, rather than a measure of effort invested. How can it be that, in our study, we find only a slight benefit to majoring in a subject? There are several explanations.

First, we did not ask our teachers and

teacher candidates to respond to the kind of questions often asked on tests of subject matter knowledge. Instead, we asked them to use their subject matter knowledge *as a teacher would*. For instance, we would ask them to develop a story problem that would illustrate a particular mathematical sentence, or we would ask them how they would explain a particular concept to a confused 6th or 10th grader. These tasks are often more demanding than the questions asked on typical tests. They do not require factual recall, but instead require respondents to explain basic ideas or to reason about an issue. In addition, respondents cannot search through a list of response categories and guess which is the best answer. Instead, they must generate the entire answer on their own.

Second, college-level subject matter courses often do not address the most fundamental concepts in the disciplines. Instead, professors provide massive quantities of information, with little attention given to the significance of each idea. Graduates may never have had to actually think about the fundamental ideas in their field, and may never have been given an opportunity to see the connections among the many "factlets" they have learned.

Finally, much of the content taught in college courses is different from the contents of K-12 classes. Mathematics majors study matrix algebra and trigonometry, even though they will probably teach ratio and proportion. English majors study creative writing but will be expected to teach sentence structure and word usage. The discrepancy is not universal, of course: algebra appears in both the secondary and college curriculums, and American history is studied at elementary, secondary, and college levels. But often fundamental concepts on which a subject rests—the meaning of division or of a complete sentence, for instance—are not addressed in college. Students are assumed to have already learned these things. When they begin teaching these things, they must draw

on what they recall from their own elementary or secondary education, not on what they learned in college.

I should temper this general finding, though, by adding that certain types of college educational experiences do make a difference. In particular, college courses or inservice workshops that require teacher candidates to reason about the subject, to argue about alternative explanations, and to test hypotheses seem to alter substantially students' understanding of the subject and better enable them to respond to the kinds of tasks we gave them. But these courses are not available in all programs, and are not necessarily a part of any subject matter major.

Accommodating Diverse Learners

Almost all the programs we studied, at every level, included courses designed to help teachers better understand the cultures of various groups they might eventually teach. However, these courses did not enhance teachers' ability to teach children who are members of these different groups. Despite a variety of attempts to prepare them for diverse students, few teachers and teacher candidates in our sample could move beyond the two contradictory moral imperatives of teaching—that teachers should treat all children equally and that they should individualize. Sometimes through these courses, teachers even became more persuaded that certain children cannot learn certain content. This finding is especially troubling, given the increasing diversity of American classrooms. Like the first finding about subject matter knowledge, this finding seems counterintuitive.

One possible explanation for this outcome is that the courses and workshops about cultural differences tended to be largely descriptive and informational, providing teachers with generalizations about group characteristics and customs. This information can inadvertently reinforce, rather than alter, latent prejudices.

Another possible explanation is that

the information provided is outside the context of other knowledge needed for teaching. Instead of learning how to respond to diversity in their math methods courses, for instance, teachers learn about student diversity in classes devoted to that topic alone. The courses tended not to discuss pedagogical implications of cultural differences among children, nor did they discuss teaching strategies for use in classrooms with

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members of the numerous different groups.

One reason for addressing diversity and pedagogy in separate classes is that the pedagogical implications of learner diversity are often not clear. Pedagogical research and theory is not conclusive about what teachers should do within the range of students they face in their classrooms, nor about what teachers should do when faced with children who come from remarkably different cultural backgrounds than their own.

It may also be that the teachers often assume that knowledge of student diversity is mainly relevant to social issues, not to issues of academic content and how it is taught and learned. Consequently, even if they are exposed to

knowledge about cultures they may not recognize its pertinence to their teaching methods.

Mentors

A popular theme in the teacher education reform is a call for more on-the-job guidance. Many states and districts are now providing each new teacher with a mentor. But our data suggest, while mentors may help beginners with the emotional adjustments to teaching, and may reduce attrition among first-year teachers, the availability of mentors by itself does not guarantee that teachers will learn better teaching than they would have learned without the mentors. Many of the novices we observed became very traditional teachers: they did not learn how to improve the content they taught nor how to critically examine their own practices, even though they had access to mentors.

Why don't mentors necessarily help their students improve? One reason is that the role models that novice teachers observed while they were children continue to hold tremendous sway. Often, despite their intentions to do otherwise, new teachers teach as they were taught. The power of their "apprenticeship of observation," and of the conventional images of teaching that derive from childhood experiences, makes it very difficult to alter teaching practices and explains in part why teaching has remained so constant over so many decades of reform efforts.

Possibly, too, mentors assigned to novice teachers are not always effective teachers of academic content. They may not be inclined to teach challenging content, may not have a deep grasp of the subject, or may not know how to engage all students with the subject. The kind of teaching asked for by reformers does not exist in so many corners that mentors of this kind are widely available.

Furthermore, even if the mentors are selected because of their ability to teach challenging subject matter to diverse



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learners, they may not be qualified to teach *teachers* even if they are very good at teaching *children*. Their knowledge of teaching may be tacit, so that they don't know how to explain their own practices or guide novices.

This is not to say, however, that all mentor programs are doomed to failure. We studied one program that was highly successful. It differed from others in several ways. The mentors in this program were released temporarily from full-time teaching: mentoring was given their full attention. In addition, the mentors received training in the task of mentoring before they began their new role and on-going assistance afterwards. They met as a group regularly to discuss the challenges of mentoring. Finally, the preparation and assistance these mentors received focused on the goals and purposes of teaching, on academic content, and on how to reason pedagogically, not just on the most pressing issues of discipline and classroom management.

Alternative Certification Programs

Alternative certification programs are another popular idea in teacher educa-

tion reform. Our data suggest that, while these programs may succeed in attracting more and different kinds of people into teaching, they do not necessarily produce better teachers than other approaches to teacher education. The two alternative certification programs in our study were similar in content and character to traditional programs and weaker in some respects. There are at least two reasons for this finding.

One reason is that alternative certification programs are often based on the assumption that teachers already know the subject matter they need, and that they can learn a lot about teaching with the help of a mentor. Both sides of this assumption are questionable, as I mentioned earlier.

Too, many alternative certification programs are not designed to improve the quality of teaching. While alternative routes often succeed in altering the demographic backgrounds of their candidates—the two in our study attracted large proportions of minority candidates, for instance—their programs do little more than help these novices learn to survive in classrooms and fit into the local school setting. The two we studied were not designed to

help teachers devise new, improved teaching techniques or to criticize their own practice.

Preservice Programs

In our study of five preservice teacher education programs, we found these programs differed remarkably from one another in their structure and orientation. Some were four-year; some fifth year, with teacher education beginning after the student earned a bachelor's degree; and some five-year, with teacher education integrated throughout the five years. They differed in the number and mix of professional courses and field experiences they required. Some emphasized liberal arts education, some research on teaching, and some the craft of teaching. And they differed in the kind of teachers they hoped to produce and in their tacit theories of how novices can learn to teach. That such differences exist gives the lie to a popular assumption that all teacher education programs are alike.

What was even more interesting, though, is that these preservice teacher education programs also differed in the populations that they tended to attract. That is, high school students with different beliefs about teaching chose different preservice teacher education programs. In fact, the differences among students who selected these programs were so striking that the faculty often designed their program's orientation in response to the students they tended to attract, sometimes to shore up weaknesses of students, sometimes to redirect their ideas.

In a program where the teacher candidates were highly academically oriented, for instance, the program devoted more course time to helping candidates become more knowledgeable about, and sympathetic toward, different kinds of pupils. This interaction between programs and candidates makes our data difficult to interpret, for the outcome of any given program is a function not only of the program configuration but also of the characteristics of

the candidates who selected the program and of the relationship between the candidate characteristics and program design.

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to put field experiences, for instance, and whether to design a five-year program or a fifth year program—our data suggest that the content and character of programs is more likely to matter. Differences among teacher candidates at the end of their preservice programs seemed to be influenced by their entering beliefs and knowledge and by the conceptual orientation of the program, but not so much by the structural arrangement of the program.

Improving Teaching Practice

The findings from the TELT study suggest that there are no simple bromides for improving the quality of classroom teaching practice. We will not achieve the kind of teaching we want simply by requiring students to major in the subject, or by giving new teachers mentors. And even if our alternative routes attract different people

into the classrooms, their teaching practices are still likely to be quite traditional.

None of this should be surprising, for teaching requires a variety of kinds of knowledge and requires that these bodies of knowledge be integrated in a unique way. Teachers need an understanding of subject matter that is more explicit and deeper than the subject matter knowledge needed by other practitioners, for instance. Although writers can "use" knowledge of sentence structure or story structure in their writing, they do not need to be able to describe that knowledge or know how to help others gain the kind of understanding they have.

Teachers need not only to understand the content deeply, but also to know something about how that content is taught and learned. If they learn a series of specific teaching techniques without understanding their rationale and without help in adapting them to particular students and classroom situations, they will be unable to make lasting changes in their practice.

On the other hand, they do need a set of skills and dispositions that enable them to pull off new methods of teaching. If their intellectual understanding of teaching is not accompanied by logistical implications, they will be equally at sea in their practice. The challenge for reformers is to find a way to help teachers in all aspects of teaching, not just the subject matter, not just the pedagogy, but both. And not separately, but in relationship to one another. No structural solution to teacher education will guarantee this outcome. □

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