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A PERSONAL RESPONSE TO THOSE WHO BASH TEACHER EDUCATION

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To each of a dozen common charges against formal programs of teacher education a personal response is made. Among other responses, it is argued that contextual knowledge of classrooms and schools is crucial for novice teachers; raw intelligence is insufficient for accomplished teaching; and as in other fields, accomplished performance will develop—if it ever develops—only over many years of effortful, deliberate practice. It is argued that programs of teacher education can offer the novice teacher the findings, concepts, principles, technologies, and theories from educational research that are relevant to teaching and learning, as they are provided to other professionals before they enter their fields of practice. It is concluded that high-quality teacher education programs are profoundly challenging, indispensable, inaugural components in the development of accomplished performance by teachers.

The arguments that have been made against formal programs of teacher education have a long history and are by now quite familiar. I will comment on a dozen of the criticisms that I often hear at the Rotary Clubs and the meetings of the business roundtables that I attend. My response to these criticisms is personal, not comprehensive, because other scholars have other data to refute these familiar but often untrue attacks on our nation's programs of teacher education (Darling-Hammond, 1997; Gitomer, Latham, & Ziomek, 1999). I will emphasize in this commentary two aspects of teacher education that I believe are greatly underappreciated, namely, the acquisition by teachers of a professional language for describing classroom instruction, and the course of development leading to accomplished performance as a teacher. In my responses, I will share insights from my own knowledge of the facts as well as how we actually do things in my very real university's teacher education program.

A LOOK AT THE CRITICISMS

List 1 presents the top 12 slurs I hear, written in the voice in which I often hear them.

List 1: Criticisms of Teacher Education

1. All you need is subject matter knowledge; the rest is a waste of time.
2. Any reasonably smart person can teach; all you have to do is follow the textbooks. Everything is laid out so well these days. That's why so many parents can effectively home school their kids. In fact, there are a whole bunch of decent people who teach in the Scouts, or for their church groups and do it quite well without ever having taken any coursework in education.
3. Teacher educators are too much like a guild. They designed the system to protect their own enterprise by keeping people out of teaching who haven't taken the approved course work. Teacher educators keep out of the classroom good, decent people with college degrees who just want to help society out.
4. Loading up teacher education programs with the methods courses actually takes away from time teachers could be getting more profound under-

standings of subject matter in the various content areas. The opportunity cost is too great if one must choose courses in teacher education over courses in a subject matter content area because of the requirements for a baccalaureate degree.

5. The methods courses are now and always have been Mickey Mouse courses, requiring no great mental powers to complete. Perhaps that is so because teacher education students are among the lowest ability students in the universities.
6. Most preservice courses are taught by people who live in ivory towers; they are people who haven't been in classes for years and no longer know schools, the curriculum, or what kids are like.
7. Teaching abstract concepts before teachers have a deep understanding of the contexts of instruction makes no sense. That is, too much teacher education is front loaded, taught long before teachers have the experience to understand the concepts.
8. Learning to teach is so context specific that it makes no sense to try to teach generalizable principles; there really are few or none of these widely applicable principles for teaching. Therefore, teachers who want to teach should just get out into classrooms to learn their jobs. That is, you really learn to teach by teaching, not by learning about teaching.
9. Teacher education isn't in tune with what is out there in the real world. There is a great misunderstanding about what parents and legislators really want.
10. Teacher educators critique existing practice so much that they make novice teachers think that almost all experienced teachers are inadequate to perform the tasks of teaching.
11. Teacher education has no accountability. Colleges of education never measure what their students know and can do after they leave the program.
12. Teachers are born, not made—it's a God-given talent like playing an instrument or performing gymnastics.

ON SUBJECT MATTER KNOWLEDGE AND TEACHING

A great deal of empirical evidence exists to refute the first charge, that all you really need is subject matter knowledge to teach well (e.g., Grossman, 1990). The fact that this idea exists so long after contrary evidence has been reviewed demonstrates that this charge has the qualities of an urban myth, like the alligators in New York City's sewers. My personal favorite study in this line of research is qualitative, not quantitative, examining in detail the teaching and student achievements of four high school history teachers (Wilson, 1989). One was an experi-

enced and well-educated history teacher. One was a new teacher of history fresh from a teacher education program. One was a Ph.D. in history, with superior subject matter knowledge, but he had not taught at the high school level. The last of these four teachers was a very experienced teacher of English who accepted a job teaching history rather than losing her job during a cutback in the district. A 2 × 2 table represents the characteristics of the teachers. Thus, there were four teachers, one high in both teaching experience and subject matter knowledge, one low in experience but high in knowledge, one high in subject matter knowledge but low in experience, and one low in both experience and subject matter knowledge.

The data were complex but reasonably clear. The new, bachelors-level history teacher seemed the weakest of the four teachers. He lacked both a depth of subject matter knowledge and pedagogical experience. The experienced and well-educated teacher of history, with years of classroom experience, seemed the strongest of the four teachers. The more interesting comparison was between the English teacher with vast stores of pedagogical knowledge and little in the way of subject matter knowledge versus the history teacher with a Ph.D. who possessed a depth of subject matter knowledge but had little pedagogical knowledge.

So, what happened in this comparison? The teacher with the pedagogical knowledge outperformed the teacher with the subject matter knowledge in some important ways. There really does appear to be a knowledge base made up of organized ideas that can be labeled in part pedagogical knowledge and in part pedagogical content knowledge. These kinds of knowledge are quite distinct from the facts, concepts, and principles that constitute subject matter knowledge. It appears as well that possessing a good deal of pedagogical knowledge and pedagogical content knowledge makes one a better teacher. Subject matter knowledge is simply not enough to make one an accomplished teacher. This conclusion provides a segue to discuss Criticism 2, about how any smart person is able to teach.

ON INTELLIGENCE AND TEACHING ABILITY

There is a favorite study of mine, not unlike the one I just mentioned. This time, however, we deal with four kinds of students, not four kinds of teachers (Schneider, Korkel, & Weinert, 1989). The students were distinguished by their levels of background knowledge in an area and their IQ levels. One group of students was high in terms of both background knowledge of the subject of the text and measured intelligence, the second was high in background knowledge but lower in measured intelligence, the third was high in intelligence but low in background knowledge, and the fourth was low in both intelligence and background knowledge of the subject.

These high- and low-IQ students were given a text to read in an area about which they did or did not have deep understanding; that is, the students had more or less background knowledge and context for the subject of the text. The results are quite unusual and have been replicated.

When tested, the students with high background knowledge and high general intelligence as measured by the IQ test scored the highest and caught the most anomalies in the story that they had read. This is not a surprising result. Similarly, the students with low background knowledge about the story and low general intelligence scored the worst on the test battery. This also is not surprising. The real comparison of interest is between students with high background knowledge about the story and low general intelligence versus students with low background knowledge but high general intelligence. Here the results were surprising. The students who were not smart in the ordinary ways that we use to measure these things but who understood the context of the story outperformed, in all ways, the students who were smart by ordinary definitions but lacked depth of knowledge about the context of the story. In fact, these students of low general ability and high levels of contextual knowledge scored as high as those who possessed high general intelligence and high contextual knowledge.

The study makes clear that being smart is absolutely no substitute for being very knowledgeable about a particular area in which you need to be smart. General aptitude, *g*, or fluid ability is a wonderful characteristic to possess, and it certainly helps you obtain a substantial portion of life's benefits. But, deep knowledge of context in a particular area is easily the more important characteristic to possess if you work in a complex environment. In a complex environment, such as teaching fifth grade or demonstrating principles of physics to a high school class, context-specific, crystallized knowledge is much better to possess than context-independent, fluid ability. Nobody I know doubts that people regarded as smart in some general sense have an excellent chance to become accomplished teachers over time. But, if they come into teaching without preparation, during the few years they will need to become smart about the contexts of teaching and the complexity of classroom life, they will deny their students the benefits that accrue to teachers who have acquired more and better contextual knowledge through a high-quality, field-based teacher education program. This study has particular relevance to the arguments for and against initiatives that seek to place accomplished persons with minimal teaching background in the classroom, for example, the Teach for America program, which provides unusually smart and thoroughly inexperienced teachers to inner-city school districts serving poor children.

ON THE TIME NEEDED TO GET SMART ABOUT TEACHING

Our scholarship has progressed so that we can now estimate the time it takes to get smart about teaching. Anecdotally, teachers report that it is a 3- to 5-year process. The model of the development of expertise that I have proposed (Berliner, 1994) suggests that it takes about 5 years to proceed from the novice stage of development to the advanced beginner stage to the competent stage of development. But, Omar Lopez (1995) (see Figure 1), using the State of Texas testing archives with data from about 6,000 teachers, informs us that when the out-



From Lopez (1996)

Figure 1 Average Standardized Test Score Gain by Teacher Experience (N = 5,997)
SOURCE: From Lopez (1995).

come is test performance, about 7 years are required for teachers to maximize their students' test performance. This means that when policies result in high rates of teachers' leaving the profession or a district, when student enrollment growth rates are high (i.e., whenever new teachers are required in large numbers), achievement test performance will be depressed. Apparently, even with a program of teacher education, classroom teaching is too complex a job to be learned very rapidly. But, can teacher education help?

The *raison d'être* for teacher education is for novices to feel competent as teachers faster, to have novices maximize outcomes quicker, and to deliver more accomplished teaching to the students of novices sooner. This is precisely the same rationale for education in other professions and trades, whether those be medicine, pharmacy, or electrical engineering on one hand or plumbing, construction, or cosmetology on the other. (As an aside, I have always wondered why a state like my own would demand training and licensing for real estate sales people and cosmetologists but simultaneously argue that it has no such responsibility for child care workers

or teachers. What are we to make of a wealthy state whose legislators are on record as taking more interest in the growth of the housing market and the growth of hair than the growth of children?)

ON TEACHER EDUCATION AS A GUILD

The third criticism about teacher education is that it is like a guild, keeping out certain people who have not had the approved teacher education coursework. This is easily countered if you accept the two previous arguments, namely, that pedagogical knowledge exists and needs to be acquired somewhere and that raw intelligence is not enough to be a competent teacher.

Because we teacher educators are not the fools we are sometimes portrayed to be, we fight for certain standards in our teacher education programs. A high-quality teacher education program (like my own university's and hundreds of others) will place its students in public schools early in their education coursework precisely to gain the contextual knowledge that is so important for becoming a competent teacher. A high-quality teacher edu-

cation program (such as our own and hundreds of others) will also have the methods courses taught in the public schools to help teacher education students acquire the knowledge they need of context, pedagogy, and pedagogical content knowledge that are required of a competent instructor.

No one I know denies the importance of deep understandings of subject matter in promoting high-quality student learning. But, subject matter knowledge needs to be recognized as a necessary, not a sufficient, condition for accomplished teaching to take place. Thus, it is appropriate that teacher educators protest the easier, quicker, deficient, and cheaper alternative programs of teacher education and those proposals that call for no teacher preparation. So, when teacher educators appear sometimes to act as members of a guild, their actions may be in the public interest and not such bad behavior after all. A guild is a professional association. Professionals have developed standards of behavior that are important for them to uphold, seeking to honor the wisdom they have acquired and to protect the public from incompetence. Thus, there is a reason that the medical profession does not let me do surgery. Prohibitions against my practicing medicine are not merely for the protection of the surgeons' incomes. Similarly, teacher educators often try to protect the public from preparation programs that appear to be deficient or even nonexistent.

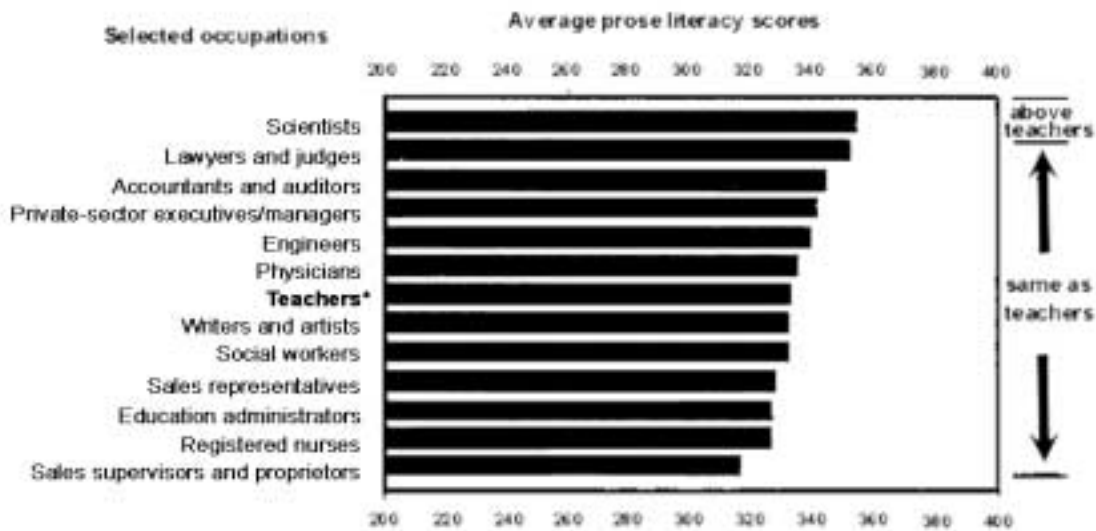
ON TEACHER EDUCATION COURSEWORK AND THE SKILLFULNESS OF TEACHERS

The fourth criticism, about too many teacher education methods courses' being offered, may now be seen in a different context. If subject matter competency is still believed to be all that is needed to teach well, then this criticism is valid. But, if high-quality teaching methods courses do exist, and in those courses there is an emphasis on the techniques and principles that help to translate subject matter knowledge into cognitive structures that are useful and accessible for students, then the worth of teaching methods courses is easily defended.

For example, in a demonstration lesson during a teaching methods course, a novice teacher might witness an attempt to engender deep understanding of some subject matter with an increased likelihood of transfer by using problem-based instruction or project methods. In field-based methods courses, this activity would be observed and discussed. But, precisely these contemporary instructional methods are rarely seen in university courses by students pursuing degrees in English literature, mathematics, or physics. Similarly, it is possible that in a school-based methods course, a novice teacher will witness the development of students' motivation to achieve through group methods of instruction. But, it is still the rare university subject matter course that makes use of cooperative methods. And again, in a bilingual science methods course, a novice teacher can learn how knowledge in one's native language can be used to facilitate acquisition of concepts in English. But, it is almost never the case that bilingual education of any type occurs at the university level. So, it is possible that novice teachers who go into the classroom without teaching methods courses will have the barest understandings of problem-based instruction, project-based instruction, cooperative learning, bilingual and English as a second language methods, and so forth. If it were not for the teaching methods courses, the novice teacher's repertoire of teaching skills would be severely limited.

Universities provide limited models of instructional methods for their students; even when future educators are exposed to innovative teaching methods at the university, they are offered no place to study how those methods work, why they work, and under what conditions they should be used. Teaching methods courses provide the fora for such investigations.

A problem we have in communicating what methods courses accomplish is that syllabi for these courses often sound quite simple when described in plain, everyday English. But, the same is true when we look at methods courses in other fields. Making rounds during training to be a physician is essentially coursework for the



From the National Center for Education Statistics, 1996

Figure 2 Prose Literacy Scores, Labor Market Outcomes, and Other Characteristics of Full-Time Employed Bachelor's Degree Recipients, by Selected Occupations, 1992
 SOURCE: From National Center for Education Statistics (1996).

learning of medical methods (i.e., intake questions, palpating the chest, diagnostics, etc.). Two full years of medical rounds in a program of clinical medicine could accurately be described as following an experienced physician around and learning what he or she does. That sure does not sound like it is worth \$30,000 a year in tuition dollars! Teaching methods courses are at least as complex as are medical methods courses, and that complexity is equally hard to describe in plain English. But, if such courses are of high quality, they are as fundamental to the development of pedagogical skills for a novice teacher as are the medical methods courses for a novice physician.

ON MICKEY MOUSE COURSEWORK AND DUMB STUDENTS

The fifth criticism is about the Mickey Mouse coursework and our dumb students. Gitomer et al. (1999) have extensive and convincing data

about the academic skills of teacher education students. It is simply not true that those who graduate from our teacher education programs are any less talented than students from other majors in our nation's universities. Additional data from adult literacy surveys (see Figure 2) place teacher literacy equal to that of physicians, engineers, and practitioners in many other high-prestige fields. Because the correlation between measures of literacy and traditional IQ tests is so high, relying as they almost always do on similar measures of vocabulary, it is likely that teachers have approximately the same IQs as those in law, managers and executives in business, and those who work in finance.

But, the charge about Mickey Mouse coursework is one I often make too, even with my own faculty. It is not that methods courses have to be simple minded, for they certainly can be quite complex. And, it is not just that methods courses are too easily described in simple

English language, though that helps to give them their bad reputation. I believe that methods courses in schools of education, as ordinarily conceived, grossly underestimate the ability of our teacher education students for complex work. We have data informing us that our students are among the better ones in the universities, as measured by course grades. In terms of their overall grade point averages, they are at the average of the rather elite group that graduate from our colleges and universities, and we know also that they possess high levels of literacy skill and high IQs. But even with those qualifications, preservice teachers do not ordinarily get the weekly reading loads that are required of literature majors. They do not ordinarily get to interpret the primary documents of their field, as history majors do. They do not ordinarily get extra time every week in a laboratory for teaching and learning, which could serve the same function as a laboratory does in physics or biology (Berliner, 1985). They do not ordinarily get the case-based instruction that business majors do, despite the fact that case knowledge is the basis for expertise in teaching. I am afraid that here I join the critics. I do not believe that we stretch our students intellectually as we should, or in the ways in which they are capable.

ON TEACHER EDUCATORS AND IVORY TOWERS

If Charge 6 was ever true, it is less true today than previously. Today, high-quality teacher education programs (our own and hundreds like ours) often use distinguished practitioners as clinical faculty to teach in the preservice teacher education program. Like many other teacher education programs around the country, we have placed almost all of our teaching methods courses out in the public schools, making use of real teachers and real children. By doing this, we avoid the charge that our teacher educators and novice teachers do not understand life in schools. In addition, along with other institutions striving for a high-quality teacher education program, we have built professional development schools designed purposely for intensive teacher education at a sin-

gle school site throughout the entire preservice teacher preparation program. The charge about ivory-towered teacher educators will not hold up.

I believe the public is not careful, often confusing teacher educators' disagreement with common school practices as an example of ivory-towered thinking. Agriculture would not have changed one iota if the extension agents had not disagreed with common farm practices. Those same extension agents were called ivory towered. The conservatism of practitioners in many fields needs to be challenged. Who better to challenge practice with ideas fresh out of the ivory tower than the extension agents from the schools of agriculture or the teacher educators from the schools of education, coming as they do from places where knowledge is created and transformed?

ON THE FRONT LOADING OF TEACHER EDUCATION

The seventh charge might have some validity for some programs. Front loading teacher education coursework, that is, teaching the propositional (factual) knowledge of the field without students' gaining enough contextual experience to understand what they are being taught, is a mistake. But, the heavier the field component of a teacher education program, the less this charge is true. And today, we (and hundreds of teacher education programs like ours) have strong field-based programs of teacher education. These ensure that students understand propositional and procedural knowledge (how to do things such as preparing a lesson plan) in real-world contexts. Furthermore, we (and hundreds of teacher education programs like ours) engage in on-the-job mentoring for the graduates of our programs. During these programs, experienced mentors help novices to integrate the knowledge derived from the university into the lessons they teach in their own classrooms. Our program is called the Beginning Educator Support Team (BEST). It provides experienced mentor teachers, often nationally board certified teachers, to hundreds of novice teachers for the first 2 years of their careers. BEST is

designed to bridge the gap between university training and the real world of the classroom, retain more teachers for the profession, and help novice teachers pass their permanent certification tests that are given 2 years after they start to instruct. When talented mentor teachers work with novice teachers, the possibility exists for the integration of theoretical knowledge from the university and practical knowledge from the field. Mentor programs provide a mechanism for the melding of the propositional and procedural knowledge learned in programs of teacher education with case knowledge, the practical knowledge derived directly from actually teaching. In colleges of education where field-based and mentoring programs exist, this charge has no validity.

There is more reason than ever before to defend preservice teacher education. That is because the research community has developed powerful findings, concepts, principles, technology, and theories about classroom teaching and learning that need to be learned. Teaching is not a craft to be learned solely through apprenticeship. It has a scientific basis as well, and thus, similar to other scientific fields, its fundamental findings, concepts, principles, technology, and theories need to be communicated. University coursework is the usual mechanism through which such important information is communicated.

By *findings* in educational research I mean the individual pieces of replicable data from the research community that are not necessarily well embedded in very elaborate theory or useful as general principles of instruction. Every field has these kinds of findings. In our field, we have findings associated with the power of review, practice, and high success rates. The power of these factors has been shown to improve academic achievement in dozens of studies. We have a coherent set of findings about retention in grade that is not embedded in or greatly influenced by any complex theory. We have replicable findings about the use of advance organizers, provision of academic feedback to students, use of higher order questions in recitations, provision of verbal markers of importance in lectures, and use of student

summaries at the end of lessons. We also now know a great deal about the effects of small class size on learning and the distress of teachers and students when facing high-stakes testing. We have literature on the power of project-based methods of teaching, the positive effects associated with cross-age tutoring, and so forth. The theoretical ties associated with these findings are not obvious and sometimes seem to be forced, but their empirical status cannot be questioned. Each finding has been replicated. Where but in programs of teacher education will these findings be studied and learned?

By *concepts* in educational research, I mean the terms and ideas that help us label and identify aspects of classrooms and schools to help render them more understandable. These concepts are developed from both analytic and empirical work. They are used to describe phenomena that might not be attended to as readily if instead we could not name and describe those phenomena. For example, educational research has given us such rich and useful concepts as curriculum alignment, academic learning time, withitness, grade surety, buggy algorithm, multiple intelligences, zone of proximal development, accommodation and assimilation, authentic assessment, portfolio assessment, situativity, constructivist learning, legitimate peripheral participation, propositional and procedural knowledge, and so forth. Without such concepts, educational practice is a field for the amateur and the dilettante. On the other hand, armed with exposure and engagement with such concepts, professionals can transform the apparent complexity of classroom teaching into something more understandable, more predictable, and more controllable. Where but in programs of teacher education will these concepts be studied and learned?

The elaboration of these ideas from research often takes the form of principles, because principles are two (or more) concepts linked together in a causal relationship. For example, if students do not have sufficient grade surety, then they and their parents will be anxious. Or, districts that have aligned their curriculum with the assessment instruments to measure student achievements will have higher scores on those

measures than districts that do not. Brophy (1999), for example, has recently codified findings and concepts from research on teaching into a set of principles substantiated by research. These are given in List 2, below. Where but in programs of teacher education will these principles be studied and learned?

By *technology* for teaching and learning, I mean systems of instruction like cooperative learning as designed and tested by Slavin (1990) and others. Another teaching and learning technology is complex instruction as designed and tested by Elizabeth Cohen (1986). Reciprocal teaching as designed and tested by Palincsar and Brown (1984) is another such technology. We could also identify as technology the Missouri Mathematics Project as designed and tested by Good and Grouws (1979). Then there are the well-verified claims about enhancement of achievement and attitudes toward schooling associated with cross-age and peer tutoring projects. We have a rich literature on how to conduct project-based learning in science and the social studies. There is the reading recovery program and its offshoots, Success for All, or dual-language instructional methods. That is, there are many technological inventions that are applicable to environments in which teaching and learning take place.

Compared to basic telling as teaching, these are technologies as much as is a new computer in the classroom. We have a good deal of well-researched instructional technology to offer schools to promote change. Where but in programs of teacher education will these technologies for teaching and learning be studied and learned?

By *theory* I mean something like the formal and mathematically specifiable model of school learning first proposed by John B. Carroll (1963) 30 years ago. The broad characteristics of this model have been verified in more than 300 empirical studies (J. B. Carroll, 1985) and by common sense as well. Other, less well-specified, but no less well-developed theories exist, for example, the contemporary constructivist model of learning. This is a model of learning and motivation with direct implications for curriculum, instruction, and assessment. We also

have Vygotskian perspectives on the social nature of knowledge, with its many implications for schooling. And, we have mature and well-verified theory surrounding achievement and attributions about achievement associated with competitive versus personal goal structures in classroom learning. In fact, the entire field of motivation is influenced by and has verified the importance of the Expectancy \times Value theory of motivation first proposed decades ago. Where but in programs of teacher education will these theories about teaching, learning, and motivation be studied and discussed?

Why is this highly abbreviated list of findings, concepts, principals, technology, and theories important? Because it demonstrates that the educational research community has created a technical and professional language for the education profession. The failure to provide educational opportunities for novices to learn these findings, concepts, principles, technologies, and theories is the equivalent of sending physicians or accountants into hospitals and businesses to learn their craft without benefit of medical or business school. It is both silly and degrading to take seriously the notion that teacher education is unnecessary, unless one is also willing to say that education in all the professions is unnecessary.

ON THE LACK OF GENERAL PRINCIPALS OF INSTRUCTION

The eighth criticism is nonsense. We have many codified general principles of instruction. One such general set was recently provided by Brophy (1999), and the principles are listed in List 2. These are based on extensive research on classroom teaching and learning and have the backing of large numbers of the research community. These are general principles that are deceptively simple when stated in plain English, but they require amazingly complex behavior to implement in real-world classrooms.

List 2: Principles of Effective Teaching

1. With regard to a supportive classroom environment: Students learn best within cohesive and caring learning communities.

2. With regard to opportunity to learn: Students learn more when most of the available time is allocated to curriculum-related activities and the classroom management system emphasizes maintaining their engagement in those activities.
3. With regard to curriculum alignment: All components of the curriculum are aligned to create a cohesive program for accomplishing instructional purposes and goals.
4. With regard to establishing learning opportunities: Teachers can prepare students for learning by providing an initial structure to clarify intended outcomes and cue desired learning strategies.
5. With regard to coherent content: To facilitate meaningful learning and retention, content is explained clearly and developed with emphasis on its structure and connections.
6. With regard to thoughtful discourse: Questions are planned to engage students in sustained discourse structured around powerful ideas.
7. With regard to practice and application activities: Students need sufficient opportunities to practice and apply what they are learning and to receive improvement-oriented feedback.
8. With regard to scaffolding students' task engagement: The teacher provides whatever assistance students need to enable them to engage in learning activities productively.
9. With regard to strategic teaching: The teacher models and instructs students in learning and self-regulation activities.
10. With regard to cooperative learning: Students often benefit from working in pairs or small groups to construct understandings or help one another master skills.
11. With regard to goal-oriented assessment: The teacher uses a variety of formal and informal assessment methods to monitor progress toward learning goals.
12. With regard to achievement expectations: The teacher establishes and follows through on appropriate expectations for learning outcomes.

ON TEACHER EDUCATORS NOT KNOWING WHAT PARENTS AND LEGISLATORS WANT

The critics who believe educators do not know what parents and legislators want may be confusing professional responsibility with not knowing what the public wants. Because some of what the public wants is thought to be inappropriate by teacher educators, they must challenge some of what is said and legislated. Many parents and legislators want phonic drills in early elementary classrooms. But, many teacher educators stress more literature-oriented programs. Should not the professionals have their

opinions entered into this debate as well? If some parents and legislators want creation science taught, should not the broader educational community—particularly teachers and teacher educators—have a voice in challenging that? If parents or legislators do not want children participating in discussions of sex and human development, should not the educational community speak out, noting that children today need knowledge about these aspects of life because they can literally die from their ignorance? If teachers are taught to be politically active, work in professional groups, and lobby on behalf of children and families, is this wrong? If teacher educators lend their voices to the protest over high-stakes testing, publicly express their concerns about a district grade retention policy, or make public the side effects of a zero tolerance policy that is desired by some parents and some legislators, is this bad for the nation?

It is not true that teacher educators and classroom teachers are out of touch with the legislators and parents in a community. It is true, however, that teacher educators are often professors with expertise in scholarship, often have well-grounded opinions, and are citizens of the same public, and so they properly demand to be part of the debate. If they are cut out of the debate by legislators and business leaders, democracy and education will surely suffer.

ON THE CRITICISM OF EXISTING PRACTICES

The tenth criticism is probably true—novice teachers probably do critique experienced teachers a lot, and they probably get some of that attitude in their teacher education programs. But, I would like to know of a profession where the initiates do not criticize the older practitioners of that profession. In my experience, new clergy, new physicians, new police officers, new financial analysts, new computer programmers, and new farmers all criticize the older practitioners of their profession. This is especially true in fast-changing cultures where younger new members of a profession have vastly different life experiences from those of

the older generation with status in the profession. It is entirely natural for the young to criticize the old—as it is for the old to criticize the young. Thus, this criticism has no particular merit. Despite their criticisms of each other, the younger generations do learn from the older, just as the older learn from the younger.

ON ACCOUNTABILITY

In my state, it is easy to refute this 11th charge. First, we have 5-year follow-ups of our graduates. They are satisfied with their training and remain in teaching in very high numbers. More than 70% are still teaching 5 years after graduation, which we imagine is one of the highest rates in the country. The elementary school principals who employ our teachers are surveyed regularly. In the last survey, 90% of them were satisfied or very satisfied with our beginning teachers.

We have another way to describe the impact of our new teachers on student performance in Arizona, though it requires a slightly convoluted bit of logic. That logic is as follows. We have a larger than typical number of novice teachers in the state because we are a very fast-growing state. We also are a state with a large group of immigrant students. Furthermore, our state is among the worst in the nation in terms of children's health, expenditures on education, teacher salaries, and a host of similar measures, all of which embarrass those of us who live in this rich but mean-spirited state. Yet, with many new teachers, many immigrants, and among the lowest support for education in the country, our state is at the national average on all of its norm-referenced tests. That should be considered a miracle, but of course it is not. It is, however, a way of talking about accountability that makes Arizona teacher educators look remarkably good. Of course when I point this out, it has the added benefit of making some legislators and some parents crazy!

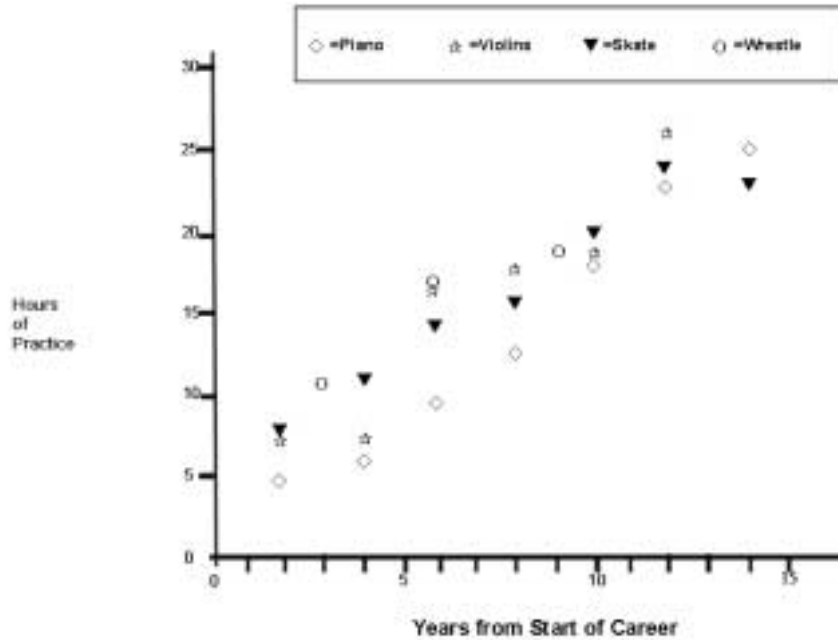
ON TEACHERS BEING BORN, NOT MADE

We have some interesting evidence that negates this 12th criticism. The evidence comes

from studies of expertise, which is a relatively new area of cognitive psychology and has direct bearing on the arguments in support of formal programs of preservice teacher education and mentoring programs during the induction years. Some studies of how people develop into Olympic wrestlers and gymnasts, concert pianists and violinists, seeded tennis players, or teachers shed light on this (Berliner, 1994). When a group of Olympians and their coaches were asked what made one a champion in their field, their answer was *never* (and I must emphasize the never) that it was God-given talent or natural ability. The answer was that experts are made by engaging in what Ericsson and Smith (1991) call "deliberate practice." This is practice during which coaches help you get some aspect of performance right. It is practice where routines are honed so they need not be thought about much. This is practice where the developing expert's own thoughtfulness allows him or her to get better at what he or she wants to do. This is practice that takes place in the head, as well as on the court, at the ice rink, or in the classroom. Deliberate practice is what makes an expert in chess, wrestling, tennis, piano playing, or teaching.

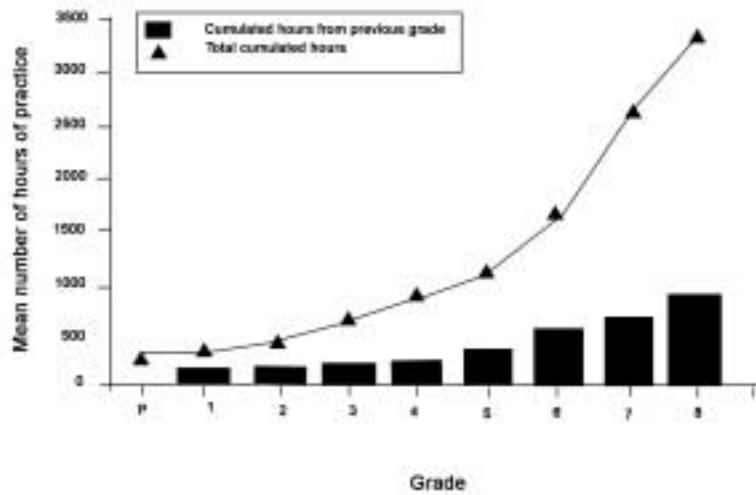
In Figure 3, we see the number of hours that are put in each week by various kinds of young people trying to be better at what they do. The graph shows vividly the amazing amount of hours per week of deliberate practice that is required to become accomplished in a particular field. Figure 4 shows the cumulative number of hours that these young people put in to be accomplished at what they do. Accomplished musicians and athletes are much less often the recipients of God's gifts and much more often highly motivated to stick to their practice schedule as well as more likely to engage in thinking about each practice opportunity they have.

Let us make it abundantly clear to our critics that teacher education is about deliberate practice. There is no way for accomplished teaching to occur quickly and without practice because there is no way that God-given natural ability can overcome the need for deliberate practice to become accomplished at anything as complex as teaching. Understanding the development of



From Ericsson, 1991.

Figure 3 Hours of Practice by Number of Years of Study for Different Domains
SOURCE: From Ericsson (1991).



From Ericsson, 1995.

Figure 4 Relationship of Cumulated Hours of Practice to Grade Achievement for Young Instrumentalists
SOURCE: From Ericsson (1995).

expertise across many fields helps us to defend the need for high-quality teacher education programs for our novice teachers.

CONCLUSION

I have stated a dozen criticisms and provided a dozen personal responses to them. I certainly do not want to go on record as saying that we teacher educators always run high-quality programs, because we do not. And, what I say in defense of teacher education does not mean that we cannot improve what we do, because improvements are certainly possible. My comments simply reflect my belief that high-quality teacher education is a profoundly challenging, indispensable, introductory component in the lengthy development needed for the demonstration of accomplished performance by teachers. I believe the developmental aspects of learning to teach, from preservice, through induction, on to in-service education, have not been given enough attention as we contemplate what teachers need in the way of education and training. I have also noted the remarkable set of findings, concepts, principles, technologies, and theories that would not be learned in low-quality programs or in the absence of a teacher education program.

It seems apparent, though it is hard to prove unambiguously, that those lucky enough to receive a high-quality teacher education program will reach the level of accomplished performer sooner and will do less harm to students than those who do not have access to a high-quality teacher education program or those who come to teaching without the experience of a teacher education program. It also seems apparent that the vast majority of those who bash the entire system of teacher education are ill informed, unhappy about other aspects of education in America, or cheap. There may also be unique U.S. sociocultural reasons for the wholesale condemnation of programs of teacher education. In a world devoted to commerce, where the worth of a person is too often judged by his or her financial statement, those who choose to remove themselves from the pur-

suit of money are considered foolish. Moreover, those who choose to work with children are not often seen as doing real work. For these two reasons, teachers in the United States have been objects of derision for centuries. Given this historical sociocultural context, it becomes unthinkable that those who spend their professional lives trying to teach devalued persons can themselves be competent. Some bashing of teacher education may therefore simply be due to our close relationship with and admiration for teachers. If this argument has merit, everything we teacher educators do to improve the status of teachers is likely to improve our own status and the perceived worth of our programs.

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