

Teaching Educational Psychology to the Implicit Mind

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With the dominance of cognitive perspectives in education and psychology has come an interest in the thinking of teachers. Since the 1980s, research has burgeoned on teachers' knowledge and beliefs; reviews are plentiful (e.g., Borko & Putnam, 1996; Calderhead, 1996; Clark & Peterson, 1986; Fenstermacher, 1994; Kagan, 1990, 1992; Nespor, 1987; Pajares, 1992; Rentel, 1994; Richardson, 1994, 1996). Researchers have investigated both explicit and implicit beliefs of preservice, novice, and experienced teachers. Although some investigators have sought to identify beliefs (cf., Weinstein, 1988, 1989), others have examined how knowledge and beliefs affect learning to teach (cf., Hollingworth, 1989) or instruction in particular subjects (Richardson, 1994).

This interest in the knowledge and beliefs of teachers is fueled by several sources. In research on effective teaching, dissatisfaction with findings about teacher behaviors led to a concern with teachers' thinking, planning, and intentions (Clark & Peterson, 1986; Fenstermacher, 1979). Several current perspectives on learning--from information processing to constructivist views--highlight the influence of knowledge on attention, understanding, and memory. What we already know, our knowledge base, "is a scaffold that supports the construction of all future learning" (Alexander, 1996, p. 31). Thus, researchers focused on the knowledge, implicit and explicit, that scaffolds learning to teach. Finally, teacher educators recognized the power of prospective teachers' entering beliefs in shaping their responses to preparation programs (Pajares, 1992, Richardson, 1996). As noted by Borko and Putnam (1996), "...the knowledge and beliefs that prospective and experienced teachers hold serve as filters through which their learning takes place. It is through these existing conceptions that teachers come to understand recommended new practices" (p. 675).

The purpose of this chapter is to examine the implications for educational psychologists and teacher educators of prospective teachers' implicit knowledge and beliefs about students, teaching, learning, and learning to teach. We begin by exploring the nature and origin of teachers'

knowledge and beliefs, then consider how prospective teachers' conceptions affect their own learning in a teacher preparation program and what might be done to enhance learning in light of these influences. Finally, we examine the implications of prospective teachers' knowledge and beliefs for teaching educational psychology.

Defining Knowledge and Beliefs

Understandings of the term *knowledge* can be traced back to the time of Socrates circa 400 B.C. For example, in *Meno and Theaetetus*, Plato suggests that human knowledge has three components (i.e., belief, truth, and justification). Based on this understanding, philosophers have traditionally defined *knowledge* as a justified true belief (e.g., Moser & vander Nat, 1987). Specifically, knowledge is a belief that satisfies two conditions: (a) the truth of what is believed and (b) the justification someone has for believing it. To embrace such a definition, however, one must accept that knowledge requires belief, but belief does not require knowledge, and the notion that individuals could agree on the nuances of justification (e.g., Goldman, 1986; Hussey, 1990).

A perusal of the learning literatures suggests a quite different definition. In fact, researchers in these areas generally define knowledge as one's idiosyncratic reserve of skills, information, experiences, beliefs, and memories. For example, in a review of research about how students learn, acquire, and use language, Alexander, Schallert, and Hare (1991) asserted that knowledge "encompasses all that a person knows or believes to be true, whether or not it is verified as true in some sort of objective or external way" (p. 317). In contrast to the more philosophical definition of knowledge, the Alexander et al. definition assumes that beliefs are a category of knowledge. It is this latter definition that has been widely accepted in the literature on teaching and learning (e.g., Alexander & Murphy, 1998; Murphy & Woods, 1996)

According to Richardson (1996), anthropologists, social psychologists, and philosophers--three groups that have studied the nature of beliefs and their connection to actions--generally agree on a definition of *beliefs* as "psychologically held understandings, premises, or propositions about the world that are felt to be true" (p. 103). As such, beliefs have much in common with concepts

such as attitudes, values, judgments, opinions, dispositions, implicit theories, preconceptions, personal theories, and perspectives and often are used interchangeably with these terms (Pajares, 1992). Years ago, Rokeach (1968) suggested that beliefs are organized in ways that are not logical but psychological, with some beliefs being more central and more connected to other beliefs, and thus more difficult to change. Furthermore, beliefs may be organized in clusters, allowing incompatible beliefs to be held in separate clusters and thus protected from each other (Green, 1971).

Knowledge and Beliefs

As the preceding paragraphs suggest, conceptions of knowledge and beliefs have been widely debated. A major distinction cited is that knowledge must have some “truth condition” or some evidence to back up the claim, whereas beliefs can be held--felt to be true--without necessarily having a base in evidence (Richardson, 1996). Nisbett and Ross (1980) considered beliefs to be a type of knowledge. They described two components of generic knowledge. The first is a cognitive component organized schematically. An example of this aspect of knowledge is a teacher’s knowledge of the school rules. The second aspect of knowledge is a belief component that involves evaluation and judgment, such as the teacher’s knowledge that some of the rules are unrealistic or unfair (Pajares, 1992). Rokeach (1968) subsumed knowledge as a kind of belief. He suggested that all beliefs have a cognitive component (knowledge), an affective component (judgment, evaluation, and emotion), and a behavioral component when action is necessary (Pajares, 1992).

Nespor (1987) suggested that knowledge and beliefs can be distinguished along four dimensions: presumption of existence, ideal or alternative state, affective or evaluative loading, and episodic structure. Beliefs assert that things (such as intelligence or personality traits) exist or do not exist. A part of a belief is an image of the ideal or alternative that contrasts with current reality. Beliefs also are associated with evaluations--feelings about what is and what should be, as in the previous example about the fairness of school rules. Finally, beliefs often are connected with well-

remembered *episodes* or events. A belief about the unfairness of school rules might be traced to an unfortunate personal encounter with a rule.

For much of the research on teachers' cognition, however, no clear distinctions are made between knowledge and beliefs. As Garner and Alexander (1994) noted, this lack of distinction is attributable, in part, to the fact that few studies have investigated teachers' conceptualizations of these terms. One notable exception is a series of studies conducted by Alexander and colleagues (e.g., Alexander & Dochy, 1995; Alexander, Murphy, & Woods, 1996; Alexander, Murphy, Guan, & Murphy, 1998) investigating how teachers and students of varying educational levels conceptualize knowledge and beliefs. Specifically, the respondents in these studies consistently conceptualized knowledge as factual, externally verified, or widely accepted content, whereas beliefs referred to ideas or thoughts that individuals perceived as true or wanted to be true. Unlike knowledge, beliefs also included subjective claims for which truth or validity was unimportant. Despite these conceptual differences between knowledge and beliefs, the majority of respondents perceived knowledge and beliefs as overlapping constructs. Simply put, respondents posited that although some knowledge and beliefs remain independent, many ideas fall in the realm of what is both known and believed. Given that teachers often seem to define knowledge and beliefs as overlapping constructs, a precedent set by other researchers of teacher cognition (e.g., Borko & Putnam, 1996; Fenstermacher, 1994; Kagan, 1992), within this review we discuss knowledge and beliefs as overlapping and somewhat interchangeable constructs.

Implicit Knowledge and Beliefs

Teachers' practical knowledge, first studied by Elbaz (1983), is "an account of how a teacher knows or understands a classroom situation" (Richardson, 1996, p. 104). A related concept is craft knowledge, or the knowledge that teachers acquire within their own practice. This is "the professional knowledge which teachers use in their day-to-day classroom teaching, knowledge which is not generally made explicit by teachers and which teachers are not likely always to be conscious of using" (Brown & McIntyre, 1993, p. 19). As such, this knowledge is

similar to Schon's (1983) conception of knowledge-in-action. The knowledge is contextual, situated, and often tacit. Yinger (1987) suggested that this knowledge cannot be separated from the actions taken by the teacher. It is through this practical knowledge that teachers can improvise to participate in changing classroom situations. Researchers in this tradition have examined connections between teachers' personal constructs and their teaching practices (e.g., Bussis, Chittenden, & Amarel, 1976; Clandinin, 1986; Cochran-Smith & Lytle, 1990) and have emphasized reciprocal relationships between personal theories and practice. Practical knowledge is a forerunner of action, but also is changed by reflection on actions. This often tacit knowledge may be embodied in images, routines, procedures, and rhythms of classroom life (Richardson, 1996).

Prospective teachers also have a store of tacit knowledge about students, learning, and teaching. Pajares (1993) noted that many college students begin their preparation for careers as strangers to the professional world they hope to join. Architects, physicians, and lawyers have ways of behaving that are unfamiliar to the novice and thus students of those professions expect to learn new knowledge, behaviors, and beliefs. The learning process "involves minimal conflict or threat, for [the students] have slight allegiance to prior expectations or ties to former practices and habits" (Pajares, 1993, p. 46). Students of teaching, however, are insiders. They need not discover the classroom or see it with new eyes because they are completely familiar with the territory--having spent the last dozen or so years of their lives in similar places. In learning to be teachers, they "simply return to places of their past, complete with memories and preconceptions of days gone by, preconceptions that often remain largely unaffected by higher education..." (Pajares, 1993, p. 46). These preconceptions, being so familiar and accessible, are powerful influences, because in learning to teach, as in all learning, what prospective teachers already know determines to a great extent what they will pay attention to, perceive, learn, remember, and forget (Greeno, Collins, & Resnick, 1996; Resnick, 1981; Shuell, 1986, 1990, 1996).

By the time prospective teachers come to our educational psychology courses, they almost surely have constructed deep and powerful implicit models of learning based on many

thousands of hours of being taught. And why is this important? Because research in cognition and education shows time and again that mental models organize how students learn what is taught in a domain and are quite resistant to change via instruction.... (Strauss, 1996, p. 18)

As Strauss indicated, implicit knowledge and beliefs about teaching are firmly in place when prospective teachers enter preparation programs. As such, the question becomes, what are the sources of these beliefs?

The Origins of Implicit Knowledge and Beliefs

Richardson (1996) listed three categories of experiences that influence knowledge and beliefs about teaching: personal experience, experiences with schooling, and experience with formal knowledge. Personal experience includes a wide range of influences such as beliefs about self and others; perspectives on the relationship of schooling to society; personal, family, and cultural values and attitudes; and the impact of gender, ethnicity, socioeconomic status (SES), religion, geography, and life events. Research has shed light on some of these personal influences by examining how life experiences are encoded in images or metaphors. Two examples are case studies of a principal whose image of community, formed growing up in a tightly knit Toronto Island town, strongly influenced his work (Clandinin & Connelly, 1987) and a teacher whose metaphor of teaching as nurturing could be traced to her years of experience as a parent (Bullough & Knowles, 1991).

Much has been written about the influence of being a student on beliefs about learning and teaching (Calderhead & Robson, 1991; Lortie 1975). A number of case studies document the role of experiences with particular teachers in shaping individuals' images and beliefs about good and bad teaching (Britzman, 1991; Crow, 1988; Grant, 1992; Knowles, 1992). Lortie (1975) described the extensive apprenticeship of observation that fosters deeply held beliefs about teaching. Strauss (1996) noted that, during their precollege education, prospective teachers are in school learning situations for at least 12,000 hours. Some researchers studying the development

of expertise assert that it takes about 10,000 hours to become an expert in a particular field (Simon, 1995). Thus, at the very least, prospective teachers come to college experts on being schooled; implicit models of what it means to teach and learn are inferred from these thousands of hours of schooling.

Experiences with formal knowledge include both knowledge of academic subjects such as mathematics or history and pedagogical knowledge, as usually encountered in formal teacher preparation programs. Beliefs about the nature and value of school subjects can be shaped by such factors as family and community norms or personal experiences learning the subject. Many beginning teachers lack connected conceptual understandings of the subjects they will teach (Bennett & Carre, 1993; McDiarmid, 1993) and this can influence their beliefs about how to teach the subject (Eisenhart et al., 1993). The impact of formal teacher education courses generally is seen as the least powerful influence on teachers' beliefs (Richardson, 1996), but some research has shown that these courses may have effects years later as experienced teachers rehear the words of their former professors with new ears (Crow, 1988; Featherstone, 1993).

Because the origins of beliefs about teaching are tied to personal experiences, the beliefs can be expected to vary. Yet some consistencies have been identified in teachers' beliefs. The following sections explore these findings.

Teachers' Knowledge and Beliefs

Initially, the knowledge of prospective teachers about teaching may be limited to what they have learned by being students--an apprenticeship of observation (Lortie, 1975). As teachers gain experience, their beliefs are shaped by their own encounters with fellow educators, students, and parents. Based on these experiences as students and teachers, what do prospective and practicing teachers know? What is tacit and intuitive for them about teaching?

Before exploring what teachers know and believe, it is important that we conceptually define certain terms central to this discussion. First, when we use the term *implicit* or *tacit knowledge*, we are referring to teachers' knowledge that they either have not reflected on or

knowledge that they are generally unaware they possess (Alexander et al., 1991). For example, beginning teachers may have never had the opportunity to analyze what they know or believe about student assessment. However, due to the enormous amount of time that students spend being assessed, it is likely that new teachers have some implicit or tacit knowledge regarding the subject. In contrast, knowledge that is in use, being analyzed, or currently guiding action is referred to as *explicit knowledge* (Alexander et al., 1991). An example of explicit knowledge would be when teachers actually put their implicit understandings of assessment practice to use in designing an ongoing assessment program in science. It is important to note that implicit knowledge becomes explicit the minute it becomes the object of thought.

Our conceptions and use of the terms *implicit* and *explicit knowledge* should not be confused, however, with implicit and explicit theories of intelligence. Indeed, the line of demarcation between implicit and explicit theories of intelligence is the source of the theory. Specifically, implicit theories of intelligence come from the knower or believer (e.g., teacher) and are somewhat a priori, whereas explicit theories are derived from the mind of the researcher or scientist observing the behavior of a particular individual. As such, explicit theories of intelligence are a posteriori or reasoned explanations for behavior.

Knowledge and Beliefs About Intelligence

Dweck and Bempechat (1983) suggested that teachers' goals are related to their implicit theories of intelligence. Implicit theories of intelligence have been contrasted with explicit theories; the latter are invented by psychologists and others to explain data collected from people performing cognitive tasks. Implicit theories, in contrast, are "constructions of people...that reside in the minds of these individuals. Such theories need to be discovered rather than invented because they already exist, in some form, in people's heads" (Sternberg, Conway, Ketron, & Bernstein, 1981, p. 37). Dweck and Bempechat (1983) have identified two implicit theories of intelligence: (a) an incremental perspective that sees intelligence as a malleable, dynamic quality and (b) an entity orientation that views intelligence as fixed and stable. They suggest that these theories of

intelligence may guide teaching practices such as selecting tasks, providing feedback, and setting goals. Teachers who hold an entity view of intelligence are likely to emphasize performance goals or "looking smart" while teachers favoring the incremental perspective stress learning or "becoming smart."

Teachers' theories about the nature of abilities also may give rise to distinct instructional practices. Evidence from laboratory simulations conducted by Swann and Snyder (1980) suggests a correlation between teachers' beliefs about the nature of ability and their teaching approaches. In this study, teachers who were led to believe that intelligence is a fixed trait gave students more autonomy in solving problems, setting as a goal that the students find their own solutions to the problems presented. Subjects led to believe that intelligence is modifiable, however, were more directive in their teaching, setting as a goal that they help students develop problem-solving skills. Thus, it appears that teachers' implicit theories of intelligence may be significant influences on teaching and learning in classrooms.

Knowledge and Beliefs About Learning

Much of the research on teachers' knowledge and beliefs about learning focuses on active versus passive views of learning. For example, Brown & Rose (1995)--referencing research on practicing teachers' knowledge of how children learn--concluded that most educators "believe that students learn in a passive manner by reacting to forces external to them, rather than in an active manner as producers of their own knowledge" (p. 21). In contrast, other researchers have found that teachers hold eclectic and common sense views of learning that highlight the importance of active involvement, or the need for an emotionally secure learning environment, or the value of trial-and-error (Anning, 1988).

Active vs. passive learning and preservice teachers. More recent research on prospective teachers' beliefs about learning suggests that many entering students also have a passive or transmissive view of learning. Holt-Reynolds (1992) found that the prospective teachers in a content area reading course rejected their professor's student-centered view of learning because

it conflicted with their beliefs about good teaching and good subject-matter classrooms. Research by Strauss and his colleagues (Strauss, 1993; Strauss & Shilony, 1994) indicated that preservice teachers' implicit mental models of learning resembled information processing models from the late 1960s (Atkinson & Shiffrin, 1968).

A basic assumption of their mental models holds that knowledge exists outside the minds of children. It is in the teacher's mind, books, and so forth. Children usually have knowledge, but it is often incomplete or incorrect. Sometimes they have no knowledge about the domain being taught. This stance leads to viewing teaching (and children's subsequent learning) as having two main parts. First, the teacher must find a way to get knowledge into the children's minds. Second, once it enters the mind, the teacher must teach in ways that children will move the new material from the place where it entered to the place it will be stored, thus adding it to the current store of already-learned concepts, skills, and so on. (Strauss, 1996, p. 19)

Hollingworth (1989), however, found that only half of the 14 fifth-year teacher education students she studied held passive, teacher-directed views of learning. In addition, several researchers including Hollingworth (1989), Bird (1991), and Richardson and Kile (1992) have concluded that prospective teachers can move toward a more constructivist, student-centered view of learning as a consequence of their preparation programs. The depth of these changes varies, however, depending on the strength of entering beliefs about learning and whether the students confronted their entering beliefs.

The impact of beliefs about learning. Anning (1988) found not only that teachers held different common sense notions of learning, but that teachers with different beliefs about how children learn tended to teach in different ways, providing different kinds of activities for their student and encouraging different kinds of classroom interaction patterns. Richardson and her colleagues (1991) found that they could predict how the teachers in their study taught reading comprehension based on the teachers' beliefs about teaching and learning as revealed in extensive

interviews. Compared to teachers with a less cognitive perspective, mathematics teachers with a more cognitive perspective on children's learning taught differently, using more word problems, for example (Peterson, Fennema, Carpenter, & Loef, 1989). Wilson and Wineburg (1988) found that beliefs about the nature of history and knowledge of history influenced how four different teacher taught their subject.

Attributions and Expectations about Students

The body of work on teacher attributions and expectations documents how student characteristics are related to teachers' beliefs about learning and their actions toward students. For example, when teachers assume that student failure is attributable to forces beyond the students' control, they tend to respond with sympathy and to avoid giving punishments. If, however, the failures are attributed to a controllable factor such as lack of effort, the teacher's response is more likely to be anger and punishments may follow (Stipek, 1996). These tendencies seem to be consistent across time and cultures (Weiner, 1986).

Since the influential study by Rosenthal and Jacobson over 30 years ago (1968), psychologists have debated the meaning, origins, and impacts of teacher expectation effects (Babad, 1995; Brophy, 1982; Cooper & Good, 1983; Good, 1988; Rosenthal, 1987, 1994; 1995; Snow, 1995). Actually, two kinds of expectation effects can occur in classrooms. The first is the *self-fulfilling prophecy* in which the teacher's beliefs about a student's abilities have no basis in fact, but student behavior comes to match the initially inaccurate expectation. The second kind of expectation effect occurs when teachers are fairly accurate in their initial reading of students' abilities and respond to students appropriately. The problems arise when students show some improvement but teachers do not alter their expectations to take account of the improvement. This is called a *sustaining expectation effect*, because the teacher's unchanging expectation sustains the student's achievement at the expected level. The chance to raise expectations, provide more appropriate teaching, and thus, encourage greater student achievement is lost. In practice, sustaining effects are more common than self-fulfilling prophecy effects (Cooper & Good, 1983).

Sources of expectations. There are many possible sources of teachers' expectations (Braun, 1976; Good & Brophy, 1997). Intelligence test scores are an obvious source, especially if teachers do not interpret the scores appropriately. Gender also influences teachers; most teachers expect more behavior problems from boys than from girls. The notes from previous teachers and the medical or psychological reports found in cumulative folders (permanent record files) are another obvious source of expectations. Knowledge of ethnic background also seems to have an influence, as does knowledge of older brothers and sisters. The influence of students' physical characteristics is shown in several studies, indicating that teachers hold higher expectations for attractive students. Previous achievement, socioeconomic class, and the actual behaviors of the student are also often used as sources of information. As others have suggested (e.g., Graham & Weiner, 1996; Stipek, 1996), we have found that prospective teachers often assume that when learning does not happen, differences are due in large part to the students' lack of effort or an unsupportive home environment. A sometimes competing explanation offered by preservice teachers is their own failure to be clear and interesting—two characteristics that occur frequently in prospective teachers' beliefs about teaching, as we will see in an upcoming section..

The effects of teacher expectations. Expectations and beliefs focus attention and organize memory, so teachers pay attention to and remember the information that fits the initial expectations (Fiske, 1993; Hewstone, 1989). Even when student performance does not fit expectations, the teacher may rationalize and attribute the performance to external causes beyond the student's control. For example, a teacher may assume that the low-ability student who did well on a test must have cheated and that the high-ability student who failed must have been upset that day. In both cases, behavior that seems out of character is dismissed. It may take many instances of supposedly uncharacteristic behavior to change the teacher's beliefs about a particular student's abilities. Thus, expectations often remain in the face of contradictory evidence (Brophy, 1982).

Teachers often group students for instruction based on expectations about student ability. And some teachers leave little to the imagination; they make their expectations all too clear. For example, Alloway (1984) recorded comments like these directed to low-achieving groups:

“I’ll be over to help you slow ones in a minute.”

“The blue group will find this hard.”

In these remarks the teacher not only tells the students that they lack ability, the teacher also communicates that finishing the work, not understanding, is the goal.

Once teachers assign students to ability groups, they usually assign different learning activities. To the extent that teachers choose activities that challenge students and increase achievement, these differences are probably necessary. Activities become inappropriate, however, when students who are ready for more challenging work are not given the opportunity to try it because teachers believe they cannot handle it--an example of a sustaining expectation effect.

However the class is grouped and whatever the assignments, the quantity and the quality of student-teacher interactions are likely to affect the students. Students who are expected to achieve tend to be asked more and harder questions, to be given more chances and a longer time to respond, and to be interrupted less often than students who are expected to do poorly. Teachers also give these high-expectation students cues and prompts, communicating their belief that the students can answer the question (Allington, 1980; Good & Brophy, 1997; Rosenthal, 1994). Teachers tend to be more encouraging in general toward those students for whom they have high expectations. They smile at these students more often and show greater warmth through such nonverbal responses as leaning toward the students and nodding their heads as the students speak (Woolfolk & Brooks, 1983, 1985). In contrast, with students for whom expectations are low, teachers ask easier questions, allow less time for answering, and are much less likely to give prompts.

It appears that feedback and reinforcement are also somewhat dependent on teacher expectations. Good and Brophy (1997) have noted that teachers demand better performance from

high-achieving students, are less likely to accept a poor answer from them, and praise them more for good answers. Teachers are more likely to respond with sympathetic acceptance or even praise to inadequate answers from low-achieving students, but to criticize these same students for wrong answers. Even more disturbing, low-achieving students receive less praise than high-achieving students for similar correct answers. On tests when an answer is “almost right,” the teacher is more likely to give the benefit of the doubt (and thus the better grade) to high-achieving students (Finn, 1972). This inconsistent feedback can be very confusing for low-ability students (Good 1983).

In general, students who are young, dependent, and conforming, or who really like the teacher are most likely to have their self-esteem affected by the teacher’s views (Brophy, 1982). If youngsters see the inevitable mistakes that accompany learning as a consequence of their own lack of ability, they are likely to lower their level of aspiration. Decreased motivation follows lowered expectations. The student and the teacher set lower standards, persistence is discouraged, and poorer performance results. Students start saying “I don’t know” or nothing at all rather than risk failure again. Here the teacher’s attributions enter the picture: the teacher accepts the poor performance and attributes it to lack of ability. The lower expectation for the student thus seems to be confirmed, and the cycle continues.

Knowledge and Beliefs About Teaching and Learning to Teach

The work of Anderson (1994), Blumenfeld (1994); Blumenfeld, Hicks, and Krajcik, 1996; Brookhart and Freeman (1992), Calderhead (1996), Hollingworth (1989), Kagan (1992), Kagan & Tippins (1991), McLaughlin (1991), Morine-Dersheimer (1993), Strauss (1993), Weinstein (1989), Weinstein, Woolfolk, Dittmeier, and Shanker (1994), Zeichner and Gore (1990), and our experience suggests that the following beliefs are characteristic of many prospective teachers:

- Teaching is *telling*--in clear and interesting ways.
- Teaching is *covering* the material.
- Teaching is *performing*--the students are an audience that must be engaged.

- Teaching is *directing*--leading activities. The best activities for learning are interesting and fun for students.
- Teaching is *engaging students*--getting their attention, arousing curiosity, connecting with students' interests, being creative.
- Teaching young children is *nurturing*--helping students feel good about themselves as they develop social skills.
- Teaching is an *interpersonal* skill that involves being fair, kind, flexible, and loving.
- Teachers will be effective if they are knowledgeable (so they can tell clearly), interesting (funny or witty helps here), creative, organized, and caring.
- Learning to teach is learning to *do*--strategies, activities, events that are interesting and "fun."
- Learning to teach young children is learning to *be*--a good, kind, caring, nurturing person (but most prospective teachers feel they already possess these qualities).
- Learning to teach is best accomplished through trial-and-error; experience is the best teacher.

In seeming opposition to the first four beliefs above--but often held by the same prospective teachers who affirm them--are the notions that learning should be "hands-on," that making lessons relevant to students' interests is the key to good teaching, and that caring about and respecting your students will virtually eliminate discipline problems. Good teaching is "fun" for students. "Creative, real-life" activities that involve important content will *lead directly and almost automatically to learning* that content (Kagan & Tippins, 1991; Putnam & Borko, 1997). In their study of prospective teachers' planning, Blumenfeld, Hicks, and Krajcik (1996) found that prospective teachers confound activity form with level of learning. They design learning activities that require complex procedures or social interactions in order to make the activities interesting, but have little sense of how these complicated procedures are related to learning. Like many inservice teachers (Prawat, 1992), these prospective teachers held a theory of "naive constructivism" that tends to confound physical and cognitive engagement. They create assessments filled with essay

questions or projects, assuming that these methods of evaluation always require higher-order thinking. In fact, the essay questions may require only memory and the projects only neatness and superficial completion of each step.

Related to these beliefs and perhaps the most common assumption that we have encountered in perspective teachers is that “traditional” teaching is bad while good teaching requires being different or surprising. As a case in point, students in our educational psychology courses often cite the example of Robin Williams standing on a desk or tearing the pages from a literature book in the film *Dead Poets’ Society*. It may be the case, they believe, that there is no one best way to teach, but there is a worst way, and it is the way of the “traditional teacher.”

Prospective students tend to value public service and the chance to help children (Brookhart & Freeman, 1992). In general, they are very confident in their own abilities as teachers, perhaps because they believe they have the qualities necessary to be helpful to children. In fact, Weinstein (1988, 1989) has found that many prospective teachers are “unrealistically optimistic” about their abilities and expect to be above average in all aspects of teaching. They look to experience as their best teacher and do not expect to learn much from their formal teacher training courses (Book, Byers, & Freeman, 1983, Richardson-Koehler, 1988). Trial-and-error combined with the “right” personality is their assumed path to teaching expertise (Calderhead, 1988).

Knowledge and Beliefs About Self

One important self-referenced belief for teaching is a sense of efficacy. *Teacher efficacy* has been defined as “the extent to which the teacher believes he or she has the capacity to affect student performance” (Berman, et al., 1977, p. 137), or as “teachers’ belief or conviction that they can influence how well students learn, even those who may be difficult or unmotivated” (Guskey & Passaro, 1994, p. 4). Research has focused on two aspects of teacher efficacy, sometimes called general and personal. General teaching efficacy is the belief that teachers in general can impact the learning of even difficult, unmotivated students from unsupportive home backgrounds. Personal teaching efficacy is a belief on the part of an individual teacher that he or she can reach such

students. (For a complete discussion of teacher efficacy, see Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998).

Origins of efficacy beliefs. The development of teacher efficacy beliefs among prospective teachers has generated a great deal of research interest because once efficacy beliefs are established, they appear to be somewhat resistant to change. There is some evidence that course work and practice have differential impacts on personal and general teaching efficacy. It seems that general teaching efficacy beliefs are more likely to change when students are exposed to vicarious learning experiences or social persuasion, such as college course work (Watters & Ginns, 1995), while actual teaching experiences during student teaching practica have a greater impact on personal teaching efficacy (Housego, 1992; Hoy & Woolfolk, 1990). General teaching efficacy has also shown a decline during student teaching (Hoy & Woolfolk, 1990; Spector, 1990) suggesting that the optimism of young teachers may be somewhat tarnished when confronted with the realities and complexities of the teaching task.

Effects of efficacy beliefs. Efficacy beliefs of preservice teachers have been linked to attitudes towards children and control (as measured by the Pupil Control Ideology Form, Willower, Eidell, & Hoy, 1967). Prospective teachers with a low sense of teacher efficacy tended to have an orientation toward custodial control, taking a pessimistic view of students' motivation, relying on strict classroom regulations, extrinsic rewards, and punishments to make students study. Those prospective teachers who scored high in both general teaching efficacy and personal teaching efficacy were more humanistic in their control orientation than students who were high in general but low in personal efficacy, or students who scored low in both (Woolfolk & Hoy, 1990). Once engaged in student teaching, efficacy beliefs also have an impact on behavior. Student interns with higher personal teaching efficacy were rated more positively on lesson presenting behavior, classroom management, and questioning behavior by their supervising teacher on their practicum evaluation (Saklofske, Michaluk, & Randhawa, 1988).

Although few studies have looked at the development of efficacy beliefs among novices, it seems that efficacy beliefs of first-year teachers are related to stress, commitment, and satisfaction with support and preparation. Novice teachers completing their first year of teaching who had a high sense of teacher efficacy found greater satisfaction in teaching, had a more positive reaction to teaching, and experienced less stress. Confident new teachers gave higher ratings to the adequacy of support they had received than those who ended their year with a shakier sense of their own competence and a less optimistic view of what teachers could accomplish. Efficacious beginning teachers rated the quality of their preparation higher and the difficulty of teaching lower than less efficacious novices. And efficacious novices indicated greater optimism that they would remain in the field of teaching (Burley, Hall, Villeme, & Brockmeier, 1991; Hall, Burley, Villeme, & Brockmeier, 1992).

Among practicing teachers, efficacy is one of the few teacher characteristics consistently related to student achievement (Armor, et al. 1976; Ashton, 1985; Ashton & Webb, 1986; Berman, et al., 1977). Efficacy also has been related to teachers' willingness to implement innovations (Berman, et al., 1977; Guskey, 1984; Smylie, 1988), teacher stress (Parkay, et al. 1988; Greenwood, et al., 1990), less negative affect in teaching (Ashton, et al. 1982), and teachers' willingness to stay in the field (Glickman & Tamashiro, 1982).

Efficacy beliefs of experienced teachers appear to be quite stable, even when the teachers are exposed to workshops and new teaching methods (Ross, 1994). Teachers who attended an "Efficacy Seminar" designed specifically to increase their sense of efficacy had higher efficacy scores immediately following the seminar but when the scores were measured again six weeks later the increases had disappeared (Ohmart, 1992). Bandura (1997) suggested that when people gain new skills and have experiences that challenge their low estimate of their capabilities, they "hold their efficacy beliefs in a provisional status, testing their newly acquired knowledge and skills before raising their judgments of what they are able to do" (p. 83).

Once established, efficacy beliefs seem resistant to change. A strong sense of efficacy can support higher motivation, greater effort, persistence, and resilience across the span of a teaching career.

Knowledge and Beliefs About Student Assessment

It is estimated that from the time students begin school through the 12th grade, that they will spend close to 1000 hours or 40 solid 24-hour days being formally assessed (Oosterhof, 1999). This rather large figure does not even include the incalculable time that students are informally assessed during their school years. As a result, we have found that our preservice teachers enter their teacher training programs with a host of implicit and explicit notions about assessment. First and foremost is the belief that traditional assessments are remnants of the days of the traditional teacher. Thus, in throwing out the ways of the traditional teacher, preservice teachers often believe that they must also throw out traditional forms of assessment. Instead, prospective teachers believe that they must employ *authentic tasks*, and concomitant, *authentic assessments*.

In addition, many of our students subscribe to the notion that traditional and standardized assessments are gender and culture biased. As examples, preservice teachers often cite the low-test scores of women and minorities on the SAT. While there are data to support this particular example, we have found that preservice teachers tend to generalize from this one example to all forms of traditional and standardized assessments. Moreover, they do not seem to be aware that poorly constructed performance assessments and portfolios can also be biased assessment measures. Finally, prospective teachers often believe that they should provide only positive feedback to students on assessments (e.g., Pajares & Bengston, 1995; Pajares & Graham, 1998). Moreover, this belief is robust even among more seasoned teachers. In essence, teachers believe that positive feedback will increase students' motivation, while specific, negative feedback will decrease students' motivation. To the contrary, motivation research suggests that specific, constructive (i.e., positive and negative) feedback is the most motivating form of feedback (Stipek, 1996).

Why Are Teacher Beliefs Important in Learning to Teach?

Pajares (1992) synthesized the research on teachers' beliefs and identified a number of assumptions that can reasonably be made in studying these conceptions. Included in these assumptions are: "Beliefs are formed early and tend to self-perpetuate, persevering even against contradictions caused by reason, time, schooling, or experience" (p. 324). "The earlier a belief is incorporated into the belief structure, the more difficult it is to alter. Newly acquired beliefs are most vulnerable to change" (p. 325). "Beliefs are instrumental in defining tasks and selecting the cognitive tools with which to interpret, plan, and make decisions regarding such tasks; hence they play a critical role in defining behavior and organizing knowledge and information" (p. 325). "Individuals' beliefs strongly affect their behavior" (p. 326). In fact, an assumption underlying the study of teachers' beliefs is that "teachers' characteristic beliefs about children and learning have pervasive effects on their behavior, influencing the learning environment that they create for children and for themselves" (Bussis, Chittenden, & Amarel, 1976, p. 16).

Richardson (1996) describes two functions of beliefs in learning to teach. First, "existing knowledge and beliefs play a strong role in shaping what student learn and how they learn it" (p. 105). Beliefs about teaching and students serve as filters and scaffolds for learning, focusing attention, shaping meaning, promoting organization, and supporting memory in learning to teach. Second, if knowledge and beliefs affect teachers' decisions and actions, their interactions with students, and their satisfaction with their profession, then beliefs should be a focus for instruction and a target for change during teacher education. Richardson describes Fenstermacher's (1979) view that one goal of teacher education "is to help teachers transform tacit or unexamined beliefs about teaching, learning, and the curriculum into objectively reasonable or evidentiary beliefs" (p. 105). However, prospective teachers' beliefs about teaching and learning are built over years of school experiences and can be highly resistant to change (Korthagen, 1993). Pajares (1992) cites a consistent body of research indicating that beliefs about teaching are well established by the time students enter college. Thus teaching the implicit mind is a challenge.

Teaching the Implicit Mind

Thus far, we have attempted to make the case that--based on personal experiences, schooling, and formal education--prospective teachers enter their preparation programs with firmly held beliefs and extensive knowledge about teaching, learning, and schooling. These understandings and beliefs, though individual, often share some consistencies. The prototypical prospective teacher is likely to believe the following: Teaching is explaining, leading, and directing but that it is also planning and implementing engaging activities. Motivating is connecting activities with students' interests and making the activities fun. If students are physically engaged and socially involved, then they will learn cognitively. If I really care about my students and I am kind and respectful, I will have few discipline problems. All students can learn, but the family backgrounds of many students make learning very difficult. Student characteristics provide information about who will and will not learn. Learning to teach is a combination of having the right personality, not being like the bad "traditional" teachers I have known, and improving through trial and error. I have the qualities to be a good teacher and I am optimistic that I will be an above average teacher--better than my peers.

We also have cited evidence to suggest that teachers' beliefs influence their planning, instruction, and interactions with their students. If beliefs are important and if the above assertions capture some common beliefs, then what is our stance as we attempt to educate these implicit minds? What do we as teacher educators believe about these beliefs?

Beliefs About Their Beliefs

A number of goals are stated or implied in the literature on taking beliefs into account in educating prospective teachers. We are encouraged to confront, challenge, transform, provoke, change, extend, and/or elaborate these beliefs (e.g., Anderson et al., 1995; Hollingworth, 1989; Pajares, 1993; Strauss, 1996). These goals are based, in part, on the assumption that change is needed. In much of the writing on beliefs, there is an implied or expressed belief on the part of teacher educators that the prospective teachers' implicit notions of teaching and learning are

dysfunctional and insidious (Wilson, 1990), unrealistic (Weinstein, 1988), or, at the very least, incompatible with the educational goals of teacher preparation programs (Florio-Ruane & Lensmire, 1990). However, Pajares (1992) raises an important issue. It would be useful to have some empirical and trustworthy evidence that particular beliefs continue to be dysfunctional beyond the preservice experience. We have research indicating that teachers' positive expectations and sense of efficacy are related to student learning, but what about beliefs that teaching involves engaging students in interesting activities? In what ways are these beliefs dysfunctional?

It may be useful to ask not what is wrong, but what is right or at least part right about entering teachers' beliefs. Even though teaching is not simply being clear and interesting, being vague and boring is not good teaching. Even though teaching is more than getting students attention by being entertaining, losing their attention is not functional. When prospective teachers value telling in clear and interesting ways, their values are consistent with much of the research on effective teaching that identified aspects of explicit instructions related to student learning (Brophy & Good, 1986; Rosenshine and Stevens, 1996). When novice teachers value student activity and engagement, they acknowledge that students have to do something in order to learn.

What prospective teachers may lack is a deep understanding of the connections between explanation, activity, and learning. How can explanation or activity support, provoke, scaffold, or encourage learning? What makes an explanation or an activity mathemagenic? With some sense of what makes an explanation or activity valuable for learning (beyond it being interesting or fun), prospective teachers might expand and elaborate their beliefs about good teaching to include how to enact those beliefs. Rather than trying to convince prospective teachers that explanation is wrong, we might help them give better explanations. This approach would begin where the prospective teachers are in their beliefs, and thus could be more developmentally appropriate.

Berliner's notion of five stages of learning to teach (i.e., novice, advanced beginner, competent, proficient, and expert) provides some guidance here. Students in educational psychology classes are moving toward novices, which Berliner defines as student teachers and

many first year teachers. Novices need to learn the objective facts and features of the situation. Commonplaces of an environment need to be discriminated, the parts of required tasks must be labeled and practiced, and some rules for action should be learned. Berliner refers to these first rules as context-free, but it might be better to consider them enabling rules (Adler & Borys, 1996) that provide a basis for initial action. For example, in driving, novices must learn the kinds of meanings and rules tested by most states in written examinations--the meaning of a blinking yellow light, or what to do when a school bus stops. Novice teachers need to know what a higher order question is, that it is not defined by form (multiple choice vs. essay question) but by the kind of thinking required. And they should learn some rules, such as wait at least three seconds after asking a higher-order question. Perhaps with experience, novices can learn to contextualize rules, but the rules provide a beginning, a basis for gaining expertise and efficacy with experience (Barone, Berliner, Blanchard, Casanova & McGowan, 1996).

If a decision is made to confront or challenge beliefs, in order to transform implicit understandings into reasoned explicit beliefs (Fenstermacher, 1979), how might this be accomplished?

Confronting Beliefs

Studies of teacher education programs and classes that intentionally attempt to confront and change prospective teachers beliefs about teaching and learning reveal both the problems and the possibilities of this endeavor. It appears that successful programs encourage students to discuss the beliefs that guide their thinking and actions, pinpoint the differences between those beliefs and the perspectives that their professors want them to consider, and analyze the advantages and limitations of thinking with and acting on their current beliefs. In addition, professors in successful programs respect their students' beliefs and use them to evaluate research-based principles (Borko & Putnam, 1996; Holt-Reynolds, 1992; Hollingworth, 1989; Ross, Johnson, & Smith, 1991). In essence, it would seem that preservice teachers must make their beliefs explicit

before they can ever hope to reflect upon them, much less, change or modify them (Murphy, 1998).

Pajares (1993) suggests several approaches to challenging beliefs. Some class activities should be designed to create cognitive conflict. Using this conflict, teacher educators can help students identify their own beliefs and explore why certain beliefs resist change. All beliefs should be examined and challenged, not just those that conflict with the beliefs of the teacher educator or the education curriculum. Concept maps, metaphor analysis, debates, and dialogue journals are possible ways to help students become aware of their own beliefs and the beliefs of their peers. We have found that asking students to analyze teaching and learning in popular films such as “Dead Poets’ Society,” “Dangerous Minds,” or “Stand and Deliver” helps to surface underlying beliefs and can spark challenges and productive conflict about “good” teaching. Analyzing these films raises many basic questions about whether teaching is explaining, entertaining, befriending, motivating, challenging, or supporting learning. As students analyze the view of teaching and learning in the films, they are more able to identify (and reconsider) their own implicit beliefs. Johnson and Johnson’s (1988) structured controversy process could be used to explore these conflicts and to model cooperative learning as well.

Prospective teachers can be encouraged to “try on” ways of interacting or teaching that conflict with their beliefs, as long as the outcomes are likely to be positive and not simply confirming of the beliefs. Often change in behavior precedes change in belief (Guskey, 1989, Rokeach, 1968). Existing beliefs can be challenged by credible sources such as recent graduates of the program or expert teachers. Here videotaped interviews with practicing teachers about the value and uses of educational psychology in teaching might be helpful. Teacher educators, even those who have extensive teaching experience, are not always credible sources. Certainly, one caveat is that teachers' knowledge and beliefs are multifaceted constructs that reciprocally influence one another (Murphy, 1998). As such, it is difficult to determine possible outcomes of knowledge and belief confrontation.

Robustness of Knowledge and Beliefs

One reason that knowledge and beliefs are so important in learning to teach is that they are robust in the face of contradictory evidence. No matter what the approach, the conceptual change (e.g., Chinn & Brewer, 1993; Vosniadou, 1994) and persuasion (e.g., Alexander, Murphy, Buehl, & Sperl, in press; Murphy, 1998) research suggests that knowledge and beliefs resist change--a useful quality for many purposes and life situations. Even researchers who report some success in affecting prospective teachers' beliefs about teaching and learning also express skepticism that these changes will persist or will actually influence actions (Ball, 1989; Bird, Anderson, Sullivan, & Swindler, 1992; Civil, 1992).

It is possible that prospective teachers learn a new vocabulary for describing existing beliefs without actually making fundamental changes (Chinn & Brewer, 1993). Feinman-Nemser and Buchmann (1989) describe a student teacher who "combined past experiences with ideas she encountered in formal preparation in a way that reinforced earlier beliefs and reversed the intended message of her assigned readings..." (p. 371). In the persuasion literature, such behavior is referred to as case building (e.g., Garner & Alexander, 1991; Chambliss, 1995). In essence, learners abstract pieces of knowledge from newly presented information that supports their existing beliefs, and disregard information that conflicts with those beliefs. Case building most often occurs when two or more stances are provided on a particular topic and none are refuted. As such, any topic for which preservice teachers are presented with multiple perspectives, and no refutational arguments regarding the given perspectives, could encourage case building.

Clearly, asking people to make changes in their fundamental beliefs about teaching and learning is difficult, bold, and perhaps a bit arrogant. The tension between challenge and support--between assimilation and accommodation, between program elements that are consistent with students' current understanding of teaching and elements that question those conceptions--is a tension that must be tolerated and cultivated.

Teaching Educational Psychology: Some Assumptions

Before discussing how students' existing knowledge and beliefs might influence teaching in an educational psychology class, we will make explicit our own biases and preconceptions. What follows are our beliefs about the educational psychology course and the processes of teaching and learning.

The Course

The main goal of an educational psychology course in a teacher preparation program is to help prospective teachers *understand, value, and use* the knowledge and processes of educational psychology, both in their lives and to support the learning of their future students. In doing so, we might also hope that the course content would help students gain more sophisticated epistemological beliefs, deepen their social and ethical understandings, or strengthen their capacity to be planful and reflective.

Most prospective teachers still encounter educational psychology as a course in a college or university program. Given this situation, certain tensions are likely. The first tension involves the evaluative climate of educational psychology courses. Often, students are asked to take risks by reflecting upon and changing their beliefs about teaching. It is not enough that they understand the material, they must also *base action* on their understanding. Initial performances of novices generally are halting and imperfect, yet, given the context of the college course, these beginners typically are graded on their beliefs, changes, actions, and reflections--not the best environment for experimentation and learning.

A second tension that comes with teaching educational psychology as a college course relates to time. There is limited time to study educational psychology and even less time to tie study to practice in field experiences or student teaching. Too many courses and experiences compete for the prospective teacher's attention. And there is no good time to teach the course. If taught early in the college program, the course seems "too theoretical" to prospective teachers with limited life and classroom experiences. If taught later, the prospective teacher often is in the midst

of completing a major or engrossed in student teaching and overwhelmed by the demands of practice.

Finally, other course work within the teacher preparation program and across the university curriculum is seldom well integrated with the educational psychology course and vice versa. Because courses are not integrated, content is often redundant. Students ask, for example, in how many different courses will they have to define “zone of proximal development” or “prior knowledge” before someone helps them understand how to use these ideas in teaching.

The Students

Here, we rely more on our combined experiences as teachers than on published work. We have found that students expect that a course with “psychology” in the title will help them cope with their future students’ “psychological problems”--the child with no friends, the student who steals, the adolescent on drugs, the youngster with emotional problems. Instead, educational psychology courses and texts give students assimilation and accommodation, schema theory, knowledge construction and negotiation, expectancy X value theories, validity, or correlation, ... In turn, students ask, “Why do we have to study this? My cooperating teacher says I’ll never use this information--it’s too theoretical.” Or we hear, “I already had that.” Of course, we believe that students come to understand, value, and use educational psychology, but not without great effort on our part and theirs.

Given the timing of most educational psychology courses early in the prospective teachers’ college program, we believe that the most valuable applications of knowledge from the course often are to the students’ current lives. Educational psychology should help prospective teachers become expert learners. Thus, we tend to emphasize personal experiences for students such as examining the factors that influenced their identity, improving their study and test-taking strategies, understanding their learning abilities and limitation. In essence, we espouse the belief that teachers must be expert learners so that they can help their students become the same. In addition, they

must become self-aware experts who have a sense of how they developed expertise and how they might make the process visible to others.

Even this use of the course is not an “easy sell,” however. The first author was reminded of this one semester when she enthusiastically shared with her class an article from the newspaper, *USA Today*, about study skills. The gist of the article was that students should continually revise and rewrite their notes from a course, so that by the end, all their understanding could be captured in one or two pages. Of course, the majority of the knowledge at that point would be learned--reorganized and connected well with other knowledge. “See,” she told her class, “these ideas are real--not just trapped in texts. They can help you study smarter in college.” After a heated discussion, one of the best students said in exasperation, “I’m carrying 18 hours--I don’t have time to *learn* this stuff!” Again, our students’ beliefs (and the pressures of their lives) make real change a challenge--even change that would seem to benefit the students immediately.

Faced with this reaction, Anita decided to help the students experience the value of integrating their understanding by allowing them to bring one page of notes to the next test. To capture the ideas from four chapters, related readings, and class activities, students had to transform information, organize specifics into more general and generative concepts, and make decisions about what is important. The process seemed to require a different kind of thinking than many students had experienced in preparing for tests. Most students found that the thinking that went into organizing their understanding was the important element. The actual notes were not that useful, in part because the test questions asked students to apply principles.

Teaching

We have described some educational psychology students’ beliefs about teaching. Of course, the perceptions we shared are colored by our own knowledge and beliefs. While the authors have varying levels of teaching and research experience, we do share some beliefs in common. Teaching is complex and unpredictable, with hundreds of decisions and exchanges occurring every day. In the midst of this uncertainty and high-speed pace, teachers must take

warranted and deliberate actions, moving toward ethical and valuable goals, drawing upon technical and principled knowledge in the process (Doyle, 1986; Kennedy, 1988; Rentel, 1994). Understanding educational psychology will help teachers in these efforts, but much more is needed, particularly a deep understanding of the academic subjects being taught and a well-developed ethical sense.

Finally, there is no one best way to teach. Different goals and students require different approaches, but in all things, let the students' learning be the guide. As we analyze a case, watch a videotape, discuss a particular teaching strategy, both authors tend to ask their class, "What do you think the students (in this case, video, etc.) are learning? How do you know? How does this fit with your understanding of the different theories of learning (motivation, development, etc.) we have been examining?" As we focus our students' attention on the learning of the individuals in the case or video, we get a glimpse of our students' learning--of the ways that they are understanding educational psychology in action. In turn, we hope that our students also gain a better understanding of their beliefs about teaching and learning.

Learning

Prospective teachers' prior beliefs, expectations, and knowledge influence what they will come to understand, value, and use from any experience, including the study of educational psychology, because *knowledge is personal and constructed* (Alexander & Murphy, 1998). Knowledge also is *situated and difficult to transfer* (e.g., Alexander & Murphy, in press; Murphy & Woods, 1996). A great part of the challenge of teaching educational psychology is helping students see the power of prior knowledge operating in their own lives, not just as a "key term" in a chapter on cognitive views of learning or as the answer to a multiple-choice question. To facilitate learning and transfer for novices, some "slowing down of action," some taking apart to make the task smaller, then putting back together into wholes is necessary. This is not the same as beginning with "basics" and later building more complexities. It is more like a musician who practices scales and routines, but also performs whole pieces and improvises--with the music

becoming more complex as the musician develops. Finally, learning is *socially mediated* (e.g., Bandura, 1997; Vygotsky, 1978). Thus, the involvement of others in learning is necessary and powerful.

Quite a bit has been written lately about the need to prepare teachers by making their learning to teach more “authentic.” Rather than viewing most teacher preparation courses as opportunities to learn skills and principles that will be applied “later” in teaching, many teacher educators and standards boards are calling for preparation that situates the learning of skills and principles in real-life teaching contexts (cf., Anderson et al., 1995; Darling-Hammond, 1994; Goodlad, 1994; Guyton & Rainer, 1996; Holmes Group, 1996; Leinhardt, 1988; Shulman, 1990; Putnam & Borko, 1997). The question is, “How?”

Putnam and Borko (1997) conclude that “there is not just one way, or even one best way, to situate teacher learning in practice. Rather there are different ways to situate learning, each suited particularly well to different components of teacher learning” (p. 42). Writing about educational psychology and teacher preparation, Anderson et al. (1995) suggest that one key to situating the learning of prospective teachers in practice is to design better tasks for teacher education students, as discussed in the next section.

Tasks for Teaching Educational Psychology

Walter Doyle (1983) defines tasks as the products students are asked to create, the resources provided, and the kinds of thinking that students are expected to apply in order to produce the outcomes using those resources. Tasks determine what academic content students will encounter, what they will do with that content, and how they will think about it. Tasks have a particular subject focus and also involve certain cognitive operations such as memorize, infer, classify, and apply, so that as students work on a task they are learning content and practicing operations. Given that much of what students know and believe remains tacit, it is important that we design tasks that have the possibility of bringing knowledge and beliefs to the explicit level.

Once at the explicit level, tasks are more likely to meaningfully influence teachers' knowledge and beliefs.

Designing Tasks

Anderson et al. (1995) describe five considerations for designing meaningful tasks for teacher education:

1. “A set of tasks should provide multiple representations of key ideas across situations” (Anderson et al., p. 152). If we take as an example the topic of cooperative learning, this might mean designing tasks that allow multiple opportunities for prospective teachers to observe productive and problematic interactions in groups. To do so, however, raises issues of depth versus breadth in coverage and also questions about cooperation across different courses in teacher preparation programs. Can enough time be devoted to peer learning within and across courses, or will students encounter superficial discussions of structures and strategies in several different courses?

2. “A set of tasks (though not necessarily every task) should feel authentic, representing as much as possible the complexity of teaching without overwhelming students” (Anderson et al., p. 152). The key here is to ask students to take several dimensions into account at once as they make decisions about teaching, then analyze the possible implications of the decisions. It can be difficult to find the right balance of authenticity, complexity, and pace that allows novices to sort through the issues and practice responses. Some simplifying or slowing down may be necessary. Simulations, microteaching, videotaping, and teaching laboratory experiences can be good initial learning situations, allowing prospective teachers to focus on manageable segments of the design, monitoring, or assessment of student learning activities (Howey, 1996).

3. “Tasks should be designed to help make explicit prospective teachers’ beliefs and conceptions, and to engage them in explaining their own beliefs and considering alternative points of view” (Anderson et al., p. 152). Strauss (1996) agrees that in order to extend and elaborate

prospective teachers' mental models we must first find ways to make explicit what was formerly implicit. Possibilities for accomplishing these kinds of tasks are described in an upcoming section.

4. "Tasks should create opportunities for public interaction among the students and between the instructor and students" (Anderson et al., p. 152). This consideration invites a recommendation to use cooperative learning in the teacher preparation classes. Certainly many teacher preparation programs include such an element. But unless the planning and execution of cooperative learning strategies are informed by knowledge about productive group interaction, it is likely that participation in cooperative learning in college classes will be miseducative. Experiences that simply reinforce prior beliefs--that group learning is mostly for social or motivational objectives or that work in groups is just a way to divide the labor (with some people always doing more or less than their share)--will not help prospective teachers understand and use peer learning. (See Woolfolk Hoy & Tschannen-Moran, in press for a model to guide the design of cooperative learning).

5. "Grading and assessment should be congruent with other considerations" (Anderson et al., p. 152). A major factor that affects how students will use a task is how they will be assessed--what is the performance to be exchanged for a grade (Doyle, 1983). The following section describes some assignments and projects that both support and challenge students' implicit understandings of teaching and learning.

Example Tasks for Educational Psychology

Assignments and assessment focus attention. If the goal of an educational psychology course is to help prospective teachers create warranted practice, then classroom tasks and assessments should focus attention on this goal. Knowing that prior knowledge and beliefs affect what will be learned and that many students believe that they "don't have time to learn this stuff," how can assignments reveal prior beliefs and motivate students to do the work necessary to expand or change knowledge and beliefs?

Examining beliefs. Lately, both authors have experimented with tasks that help students examine their assumptions about teaching and learning. At the beginning of a course, the first author asks students to draw concept maps of “good teaching” and of “learning.” First, we have to explore what a concept map is and how to complete one, how to label nodes and relationships among elements of the map. Students work individually, then explain their maps to a partner, and then modify their maps if they chose. We return to this exercise at the end of the course, redrawing maps, comparing new ideas to original work. Students must write about their current understandings of teaching and learning, what (if anything) has changed, and what readings, experiences, or reflections led to the changes.

Another approach, employed by the second author, is to have students write philosophies of learning at the beginning of the course. As part of these philosophies, prospective teachers are encouraged to examine their preexisting knowledge and beliefs about how students learn, how to motivate students, and the best methods for assessing learning. The preservice teachers are then encouraged to modify their understandings as the course proceeds, and at the end of the course, students are required to resubmit their learning philosophies. As part of this final submission, prospective teachers must reflect on any changes or modifications they have made in their philosophies.

Blumenfeld and her colleagues (1996) describe an approach to teaching educational psychology based on planning and writing rationales for plans. They use planning as a way to encourage prospective teachers’ problem solving about how to apply psychological principles in designing learning experiences for particular groups of children. By designing specific activities for particular children and relating these designs to psychological principles of learning and instruction, Blumenfeld et al. help students examine their beliefs. “The process of planning and writing rationales helps make preservice teachers’ thinking explicit. By making explicit what often remains implicit, preservice teachers can confront and reexamine their assumptions and understanding about educational psychology” (p. 51).

Renninger (1996) designed an educational psychology course that focuses on developing prospective teachers' understanding of learning. Within the course are a number of assignments and activities that encourage students to examine their beliefs about learning. For example, on the first day of the course, students are asked to decide if they believe learning is more like snorkeling or carpentry. Students meet with others who share their metaphor and discuss reasons for their choice, then work in small groups (that include advocates of both metaphors) to develop a model of learning. The groups share their models with the class and then the class as a whole identifies characteristics of learning that are repeated in many models. Finally, the students reflect on what they have learned about learning through the exercise and how they learned it. Renninger notes:

The task is designed to demonstrate to students that each of them has ideas (sometimes some rather fixed ideas) about how learning works and that there are any number of different perspectives on this subject--that when they use the word learning, they must remember that it does not necessarily mean the same thing to the other people in the room, let alone the authors they will be reading, the teachers and researchers with whom they will be corresponding, or the students they will be tutoring. (p. 65).

Students return to these models on the last day of class. They are asked to amend the models based on their current beliefs about learning. These beliefs are also reflected in their final paper for the course--an explanation of their own theory of instruction. For example, one student wrote, "My focus shifted from being teacher/theory centered to student-centered... (Renninger, 1996, p. 66).

Identifying key ideas. Lately there have been many attempts by educational psychologists to describe the nature and value of the field (e.g., APA, 1993; Bereiter, 1994; Berliner, 1992; Bredo, 1994; Calfee, 1992; Derry, 1991; Goodenow, 1992; Mayer, 1991; Pintrich, 1994; Prawat & Floden, 1994; Wittrock, 1992). We believe that students should be confronting these same issues. The first author told her undergraduate students that they had the opportunity to join the struggle. For their major assignment they were asked to do the following with their textbook:

Based on the chapters assigned (9, 10, 11, 13, 14) *identify 5 to 7 principles of educational psychology* that you believe capture the most important ideas in and across the chapters. Do not overlook any of the chapters. A principle is a generalization that relates two or more concepts and has solid research support. For example, a principle from the first half of the course might be: *What people learn and remember is determined in great part by what they already know.*

In your paper you should:

1. State each principle clearly
2. Provide a rationale for why it is important and how it is supported by research.
3. Give at least one extended example of how you would apply the principle to teaching a particular subject and grade level. (If you do not intend to teach, you may substitute an application that fits your intended occupation.)

You may work with others in the class and turn in a jointly written paper. If one paper has multiple authors, however, I rely on you to verify that all authors contributed equally and deserve the same grade.

Needless to say, students initially moaned, but later said that they learned more from this than from any other assignment because it forced them to integrate and justify. Those who chose to work together seemed to benefit even more. A number of students stepped outside the confines of the chapter structure to identify ideas themes that ran through several chapters, such as “The design of teaching and the means for assessing learning should be consistent with the learning goals.” What moved this statement beyond a empty generality was the detailed example of how this principle might be applied in a 6th grade class on hypothesis testing in science. To identify principles and example applications required the students to make explicit their implicit understandings and assumptions about teaching, learning, and testing.

Creating examples. Students can work in groups to present an example of a particular model of teaching or management. The students are required to work in groups, present the

example to the class, and then write about the experience individually--explaining *why* their presentation was a good example of the model in question and *what else* they might have done to apply the model, and *why* that might have worked. Asking students to research and enact direct instruction or cooperative learning can challenge implicit beliefs about what these approaches are or how they function. Students who believe that direct instruction is ineffective may question these beliefs as they attempt to design “good” examples of direct teaching. Students who believe that putting children in cooperative groups will automatically lead to learning may realize that the connection between grouping and learning is not dependable when they are asked to enact what can go wrong with group work

Analyzing cases. Students can work alone or together to analyze cases (video, print, or field-experienced based), with the expectation that they will use assigned readings as resources as they prepare to explain (orally or in writing, as a group or individually) the connections between their analyses and the research and theory presented in the readings. If these are rich and complex cases that can be revisited as students deepen their understanding--reconsidering the situation, for example, after studying aspects of motivation and again after examining the research on management-- all the better (Harrington & Garrison, 1992; Shulman, 1992; Wasserman, 1993). In designing a sequence of cases, we may need to heed Rocklin’s (1996) warning that different levels of complexity may be appropriate for more and less experienced students.

A number of teacher educators recommend the use of cases to develop analytical capabilities and to situate teaching skills and principles in practice (Doyle, 1990; Kennedy, 1988; Leinhardt, 1990; Putnam & Borko, 1997; Sykes & Bird, 1992). Putnam and Borko suggest that case teaching is particularly promising for exploring problems of pedagogy and for grounding theoretical ideas about teaching and learning in slices of classroom life. Both cases of problematic teaching situations and cases of exemplary teaching could be helpful in developing prospective teachers’ knowledge. Through analysis of problem cases, prospective teachers practice framing issues, generating alternative solutions, making choices about actions, and considering the

implications of their choices (Putnam & Borko, 1997). For example, video and hypertext cases might allow students to explore the complexity of cooperative learning by analyzing different tasks, goals, group compositions, strategies, and interactions--noting how changes in one of these dimensions affect other dimensions. The limitation with analysis, as Kennedy (1988) noted, is that practicing teachers cannot end with generating and evaluating alternatives--they must act. Here a second kind of case, samples of exemplary teaching, might be necessary to provide images of action (Leinhardt, 1988, 1990).

Textbooks as resources. We believe that texts can be useful in helping students examine and expand beliefs about teaching. Many of the criticisms of textbooks--that they are linear and solitary while learning is nonlinear and social, that they encourage students to memorize and regurgitate facts, that they rigidly define the course, that they are based on a discredited transmission view of learning (Berliner, 1994)--seem to be criticisms of the uses of text. Why can't reading, understanding, and applying a textbook be social? Why assess in ways that require regurgitation? Why let a text define the content or sequence of a course? At the least, a textbook can be the basis for discussion, giving students a common experience on which to base their debate. If they are allowed to explore their interpretations of the reading, the students can experience first hand the personal construction of knowledge as they discover that others "read" different information in the text. By seeing and discussing the power of preconceptions and implicit beliefs in interpreting texts, the prospective teachers may begin to examine the implicit understandings that they have taken for granted as true.

Assessing Knowledge and Belief Change

Years and years of research have been dedicated to techniques for assessing changes in knowledge, especially factual knowledge. Indeed, knowledge assessments range from traditional assessments such as multiple choice or completion to performance assessments like writing narrative essays or reciting a poem. By comparison, few researchers have attempted to measure changes in individuals' beliefs or more subjective understandings. While we would not suggest

that it is necessary to partial knowledge from beliefs or vice versa, we do assert that teacher educators should try to assess the more subjective understandings that preservice teachers possess about teaching and learning. Somewhat different than factual knowledge assessments, however, belief or subjective knowledge assessments should measure the conceptions of the prospective teacher at multiple phases during the learning process. At a minimum, preservice teachers' understandings should be measured at the beginning and the end of the educational psychology course. An even better practice would be to measure change at multiple intervals during the course. Some examples might include philosophies of teaching and learning, concept maps, or the reading of controversial topics, and the use of Likert scales or open-ended questions could be used to monitor change. While there is no way to measure how preservice teachers' actions will change after their training has ended, such assessments will help teacher educators monitor moderate changes in knowledge and beliefs during training.

Conclusions and Cautions

The preceding are just a few ideas about tasks that encourage prospective teachers to understand, value, and use educational psychology while supporting and extending their beliefs and intuitions about teaching and learning. The goals of many of the tasks are to support students as they confront and test their beliefs, offer extensions and alternatives to those beliefs, and create situations that allow students to try out beliefs in action. Another important goal is to build a foundation for a sense of efficacy that will not be dismantled by the reality shock of actual teaching. In her educational psychology text, the first author tries to communicate this goal to readers:

Becoming an expert teacher takes time and experience, but you can start now by becoming a good beginner. You can develop a repertoire of effective principles and practices for your first years of teaching so that some activities quickly become automatic. You can also develop the habit of questioning and analyzing these accepted practices and your own teaching so you can solve new problems when they arise. You can learn to look behind the

effective techniques identified in research to ask why: Why did this approach work with these students? What else might be as good or better? The answers to these questions and your ability to analyze the situations are much more important than the specific techniques themselves. As you ask and answer questions, you will be refining your personal theories of teaching. My goal in writing this book is to help you become an excellent beginning teacher, one who can both apply and improve many techniques. Even more important, I hope this book will cause you to think about students and teaching in new ways, so that you will have the foundation for becoming an expert with experience. (Woolfolk, 2001, p. 18)

Attending to the developmental level of our students challenges us to identify key ideas and defensible enabling rules. Rather than “covering” every theory, we might spend more time with fewer approaches (Alexander et al., 1996). We also must make it clear that we know and expect the rules will cease to be rules and become points for reflection as the novice teachers gain experience and a basis for reflecting on practice. A final caution, as Pajares and Bengston (1995) remind us, we do a disservice to students if we communicate to them that formal psychological principles supersede or replace knowledge of subjects being taught in becoming a good teacher.

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