The Importance of Training Highly Skilled Teachers

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Highly skilled teachers are one of the single most important influences on student success (Kane, Rockoff, & Staiger, 2007). Class size and other salient variables do not impact students’ learning trajectories as much as the quality of their teachers (Kane, Rockoff, & Staiger, 2007). In addition, teacher-based influences impact students’ performances throughout a significant span of their school careers (Sanders & Rivers, 1996). Teachers facilitate the process whereby students cultivate habits of mind and knowledge schemes that are prerequisites for success, meaningful contributions and prosperity in an open, technological world (Darling-Hammond, 1997). This makes effective teacher training of paramount importance in the cultivation of an educated citizenry within this country.

The highest performing countries in educational achievement -- Finland, Sweden, Singapore, Hong Kong and Korea -- have all make extensive teacher training a priority. Again, this illustrates the strong, positive relationship between well-executed teacher training and high-level student learning. Tuition and stipends for living expenses are provided for those in multiyear preparation programs. Salaries for new teachers are, relatively speaking, substantial. In addition, a full fifteen to twenty hours per week is allocated for collaborative planning and professional development. This practice stands in stark contrast to the three to four hours per week typically allocated to educators working in the United States. Consistent with the multifaceted support and compensation given to teachers in high-performing countries, is the practice of conferring financial incentives to those willing to serve students in more disadvantaged locations.

Teachers in the United States have received little or no incentives to work in low income contexts throughout urban and rural America. Methods of teacher recruitment however, do exist. One is called the alternate route training program, which is thought to be a tool for attracting men, teachers of color, and teachers willing to work in understaffed districts. These programs vary tremendously, yet each moves prospective teachers into full-time paid teaching positions before they have completed the requirements for licensure.

Where traditional teacher training programs instituted by schools of higher education require students to know theories of child development, cognition and pedagogy, alternate route programs cover the “no-nonsense” tools of teaching such as classroom management. Some “fast-track” programs require just four to eight weeks of pre-service training and cost as little as $500. Most of the programs are very practical and generic; little focus is placed on cultivating pedagogical content knowledge. In the end, individual states dictate what is required to hold a teaching license. This renders many who are least experienced for work in challenging contexts, quickly routed into assuming such positions.

Challenges within the urban environment however, call for more extensive, context-specific training among those who are interested in a long-term career in teaching (Vaishali, 2008). To that end, yearlong, paid residencies have been proposed. Such an approach is deemed to be superior to alternate route or standard teacher education programs because the lack of student teaching for alternate route candidates renders them often ill-equipped to manage the rigors of high-need contexts (Darling-Hammond, 2008). Traditional student teaching in disadvantaged environments can be equally problematic, as apprentices frequently watch their cooperating teachers fail to manage and facilitate the
growth of challenging students. Furthermore, cooperating teachers in high-income districts who deftly perform their professional roles provide little in the way of training for those in the field who will eventually serve disadvantaged, urban youth (Darling-Hammond, 2008).

Strongly related to the issue of teacher quality and retention is the research showing traditional teacher training as a whole, to be flawed (Levine, 2006; Darling-Hammond, 1997; Darling-Hammond, 2008). Specifically, such training is often inconsistent, conceptually loose, poorly evaluated, and designed in an arbitrary manner (Levine, 2006). For example, field experiences, often deemed to be one of the most important facets of teacher training, can range from a total of thirty hours to three hundred hours. The reasons for high and low hourly requirements, as well as all those in-between, remain unexplained (Levine, 2006).

The Student Teaching Experience

Four key sources of information have been defined as central in effective teacher training: Content area understanding; the texts, materials and settings in the professional educational sphere; research on education, social organizational dynamics, pedagogy, learning and development; and, the experiential knowledge gained from practice (Shulman, 1987). The information just listed invariably overlaps and the consolidation of these schemes is accomplished, in large part, by preservice teachers during their participation in the student teaching experience (Mayer, 2006). For example, student teachers’ who created a teacher work sample were, as evidenced by the work sample created, able to demonstrate their ability to create lessons that met the needs of individual learners. Also described in the teacher work sample was their capacity to deliver these ideas in a differentiated manner that was calibrated to accommodate student challenges and strengths (Branyon, 2008). Informing this capability was the information learned through the student teaching apprenticeship, on the school culture and the cooperating teachers’ classroom management styles. This knowledge was assimilated, to some extent, through participation in family nights, festivals, in-service workshops, faculty planning meetings, and conferences with members of the child-study team. Integrating this information allowed student teachers to focus on core content standards and devise lessons according to student need (Branyon, 2008). Thus, teaching is a complex process, informed by multiple facets of knowledge gained from various elements of experience.

Consistent with this is the assertion rendering “supervised teaching in a preK-12 school setting, [is often viewed] as one of the most critical elements in the development of a preservice teacher’s pedagogical skills and his or her socialization into the teaching profession” (Spooner et al., 2008, p.254). This is because effective teaching involves more than planning and content area expertise. Diversification of lessons to meet student needs, reteaching, classroom management, record keeping, organization, procedural efficiency, and communication with parents, are all important tasks intrinsic to the job and are “fleshed out” and explicitly understood during the intern experience (Spooner et al., 2008). Furthermore, these capabilities can be applied more flexibly and with automaticity as schemes of organized actions become increasingly well-developed through repeated practice in the classroom (Leinhardt & Greeno, 1986).

Research on teacher training indicates the lasting effects derived from the student teaching experience on new teachers’ beliefs and future practices. Beliefs are of paramount importance, as “teachers’ beliefs lie at the very heart of teaching” (Buehl & Fives, 2009, p.367). The majority of research on the congruence between teacher beliefs and practice
indicate strong alignment (Lombaerts, De Backer, Engels, van Braak, Athanasou, 2009). Consistent with this assertion is the research indicating that the school culture, characteristics, and practices either compel student teachers to espouse views consistent therein, or do the opposite (Kruger, 2008).

This requires us to ask: If student teaching is deemed to be one of the “most critical elements in the development of a preservice teacher’s pedagogical skills and his or her socialization into the teaching profession”, then what aspects of teacher training poignantly foster and enhance this process? In addition, if student teaching provides the first real, consistent opportunity to watch and collaborate with experienced cooperating teachers, then what role does the realities of the apprenticeship play in shaping the professional identity of an educator? Finally, do pre-service teachers who have completed their apprenticeships retain their beliefs about students and best practices in teaching, or do they gradually construct new schemes that reconcile the priorities espoused by theoreticians with those on behalf of peers and cooperating teachers in practice?

To answer the questions listed above this literature review will inform the reader first of what it is that teachers have to know. Broadly speaking, competent teachers need to possess elaborate knowledge structures of students, pedagogy, and pedagogical content knowledge. Central to learning these skills is sustained participation student teaching experiences that are linked to the study of correlated theoretical topics. Hence, the second component of this piece will include defining the student teaching experience, operationalizing what is gained as a function of participation, and examining various methods of training in the field. All will shed light on the constituents of optimal teacher training.

The academic literature included in this review will be derived from theorists who illustrate why teacher competence is important. In addition, teacher competence and high levels of capability will be described explicitly. The definition of the student teaching experience, as well as exemplars characterizing what is learned through such participation with cooperating teachers, will be presented. Finally, the research on teacher belief systems and the linkage between beliefs and practice will be explored.

**Teacher competence**

Teacher competence is especially complex to study and describe due to the multifaceted nature of the role and the intricacy of cognitive skills required when teaching effectively. Notwithstanding, highly competent teachers are often likened to symphony conductors or choreographers, who are capable of flexibly calibrating instruction to meet the needs of their students, in accordance with specific subject matter and an array of educational purposes (Shulman, 1987). Categories of highly skilled teachers’ knowledge base include content knowledge, general pedagogical knowledge, curricular knowledge, pedagogical content knowledge, knowledge of learners and their characteristics, knowledge of educational contexts (including school governance, finance, and community culture), and knowledge of educational ends and purposes according to philosophical and historical grounds (Shulman, 1987).

The constellation of skills teachers should possess was also captured by a triadic framework for understanding teaching and learning (Darling-Hammond & Bransford, 2005). This is comprised of knowledge of learners and their developmental and social contexts (including knowledge of how people learn, human development and the
cultivation of language), knowledge of teaching (including teaching subject matter, teaching
diverse learners, assessment and classroom management), knowledge of subject matter
and curricular goals (including education goals and purposes for skills, content and subject
matter) and the intersection of all three (Darling-Hammond & Bransford, 2005).
Therefore, the overlapping triadic framework and the categories of a highly skilled
teachers’ knowledge base are analogous and encapsulate the many things that an educator
needs to know.

On the whole, skilled teachers portray self-confidence, view their classroom as a
community of thinkers, deftly exploit opportunities to cultivate positive relationships with
their students, instruct in a student-centered fashion, demonstrate subject area mastery,
and contribute to the field as a whole via leadership and service (Smith & Strahan, 2004).

Knowledge of Students

To that end, highly skilled teachers are able to effectively manage their classroom so
that classes are run smoothly, with brief, efficient transitions that function according to a
well-ordered, flowing environment. Enhancing such classroom management is the
utilization of lessons that present students with an appropriate level of challenge, where
clarity is provided when needed so that student self-efficacy, motivation, and achievement
remain high (Jere, 1986).

Research has shown that well-managed classroom practices are established during
the first week of school (Leinhardt, 1986). For example, highly skilled elementary
education teachers spend a considerable amount of time on the first day of the academic
year explaining how to line up and how students’ should record the proper heading and
number their papers as well as modeling how to quietly raise your hand and how to engage
in choral responses (Leinhardt, 1986). Thus, effective teachers of all grade levels know that
teaching math, English and other subjects during the beginning of the year is less important
than establishing support (paper distribution and collection, getting materials ready),
exchange (choral exchanges, calling on students) and management routines (housekeeping,
discipline, movement around the classroom) (Leinhardt, 1986). Consequently, by
approximately the fourth day of school, highly effective teachers have cultivated the
skeletal structure of action within the classroom. This pattern of activity is further
reinforced as effectual teachers perpetually remind students of their expectations by
communicating cues to get pupils back on track or by stopping pre-existing activities to
address unacceptable behavior and then continuing only when the behavior is stopped
(Leinhardt, 1986). By mid-year students are able to quietly get out of their seats, line up,
pass their homework forward and engage in other necessary classroom activities with
almost no interruptions due to fighting, paper snatching or other forms of disruption
(Leinhardt, 1986).

For example, Leinhardt & Greeno (1986) compared the practices of highly skilled
and inexperienced teachers and found that the former were able to take attendance in
thirty seconds and correct homework in 106 seconds whereas the latter took six minutes to
check homework and at the end of this time still did not have an accurate appraisal of who
had completed the assignment from the previous evening. In addition, one inexperienced
teacher took five minutes to distribute paper yet it took a highly skilled, experienced
teacher only thirty seconds to perform the same task. The same pattern was revealed
during an additional homework correction, where the highly skilled teacher effectively
checked work in two to three minutes and the inexperienced educator spent fifteen minutes to accomplish an equivalent goal. This enables experienced, highly skilled teachers to spend a great deal of time on task, with minimal time wasted on getting organized or settling down. Such a result is further maximized due to the highly skilled teachers’ tendency to steal time to review math facts from extra, unused portions of the day such as lunch, bus line ups and bathroom breaks. Marked variance in efficacy, as exemplified by those who are skilled and those who lack experience, reflect the salience of practice in the field.

Furthermore, Leinhardt et al. (1987) found that inexperienced teachers, who demonstrated compromised pedagogical and management skills, lacked quick judgment and the ability to flexibly alter their practices according to unanticipated events. For example, Leinhardt et al. (1987) reported that one inexperienced teacher did not realize that her student did not complete his/her homework until that pupil had announced six wrong answers to the class. Following this, the same instructor proceeded to call on her main troublemaker to announce the next block of ten answers (Leinhardt, Weidman & Hammond, 1987).

In contrast, Leinhardt et al. (1987) found that highly skilled teachers rapidly formulated ideas regarding which students completed their homework and which were excessively challenged by the material, thereby allowing them to respond to those needs and attend to lack of homework completion quickly and effectively. Highly skilled teachers knew how to keep the class pace going by involving all students when reviewing work and through the use of effective routines on a daily basis (Leinhardt et al., 1987).

Schoenfeld’s (1998) research provides an explanation of why highly effective teachers can respond to classroom challenges automatically, or with little cognitive effort. Specifically, people abstract experiences in the world by looking at the salient features of an experience and categorizing it in some way. Humans then expect all things that resemble that category to look and behave similarly. With extended experience, people collapse this information into typical schemes and when they just “know” the properties of an exchange or a person automatically. This frees up cognitive resources, thereby allowing people to respond more flexibly (Schoenfeld, 1998). In addition, as humans gain familiarity with something they are able to fine-tune their perceptions of it. It is no wonder then that experts, including highly skilled teachers, demonstrate behaviors consistent with exemplary pattern recognition capabilities (Chi, Glaser & Farr, 1988).

**Pedagogical Knowledge**

Students also benefit due to a highly effective teachers’ propensity, and capacity, to explain concepts in a comprehensive, elaborative manner. For example, skilled math teachers have been known to present three different representations of a problem before they reveal the solution. These representations were conceptually sound, and rendered comprehensible through the use of examples and analogies that were familiar to the students (Lienhardt, 1986).

In addition, important definitions were provided at appropriate times by highly skilled teachers, whereas those lacking experience often forgot to reveal key definitions and sometimes failed to connect class exercises to the concepts they represented (Schauble, Glaser, Duschl, Schulze & John, 1995). This occurred, in part, because the inexperienced teachers did not know the subject matter content well. Consequently, in addition to omitting key conceptual ideas, they often created lengthy script-like lesson
plans that were hard for them to recall (Ball, 1990). If the lesson itself was difficult for an inexperienced teacher to remember, then extemporaneous calibration of the content according to a students’ prior knowledge or misconceptions, would be impossible to execute (Meyer, 2004).

As the lead dancer of a well-functioning troupe, effective teachers expect their students to master the curricula (Jere, 1986). Therefore, on the whole, academic teacher talk is limited to brief time frames and the presentation during such times is clear, well-structured, well-sequenced, and delivered with enthusiasm. For example, when teaching Huck Finn a highly skilled teacher gave the students more autonomy and led a student-directed whole-class discussion, yet engaged in expository instruction when teaching a more complicated text, Moby Dick (Shulman, 1987). As students reciprocated by presenting their ideas, scaffolds in the form of cues or questions were deftly provided – all of which guided the students so they could construct accurate, elaborated schemas.

Additional research on teacher skill showed that inexperienced teachers failed to grasp or utilize their students’ prior knowledge when teaching (Meyer, 2004). Accordingly, Meyer (2004) found that these teachers viewed prior knowledge on behalf of their students as factual, decontextualized static entities. In addition, the same teachers frequently disseminated definitions of topics, rendering each disconnected and lifeless (Leinhardt, 1998). When gaps in student logic on specific topics were detected by the inexperienced instructors, each was supplanted by those teachers with additional, inert facts. For example,

“...prospective teachers’ explanations of integer subtraction at this stage of the transformation process were procedural. Never were the rules justified, or backed up with mathematical reasons. Neither were the procedures for “getting the answer” linked to the meaning of the mathematical symbol in the subtraction problem. With the one exception mentioned earlier, the rules were not mathematical explanation for teaching, but simply logistical procedures to get the answer” (Kinack, 2002, p.60).

Highly skilled teachers however, asked their students to explain what they already knew about a topic, and then they used this information to guide and shape the manner in which the learners would construct additional understandings (Meyer, 2004). In fact, results from formative assessments conducted by highly skilled teachers frequently dictated the content of subsequent activities. Plans then, were flexible and student-centered. Accordingly, the ideas that students contributed were exploited by highly skilled teachers, making the dividing line between authentic experience and scholarship more permeable (Meyer, 2004). This ability to alter pedagogical trajectories in accordance with student interest may have been in part, due to a reduced cognitive load on behalf of those with expertise. Thus, if seasoned teachers knew the material and effective teaching techniques clearly and deeply, then stores of working memory capacity were available for attending to other tasks. Such tasks include but are not exclusive to, calibrating content to match the needs of each learner. Alternatively, it may have been too taxing for a beginning teacher to formulate lessons and then present each in a slightly different manner extemporaneously and in accordance with their pupil’s prior knowledge (Meyer, 2004).

As suggested previously, questioning practices are important facets of highly skilled teaching. For example, Diakiodoy & Kendeou (2001) reported that queries posed by highly
skilled science teachers enabled students to challenge their beliefs and initial conceptions about key ideas. Concepts examined included how it is possible for people to live over the entire surface of a spherical earth or how it is possible for us to perceive the ground as stationary even when it is not. In addition, highly skilled math, science, English, history and foreign language teachers required their students to explain how they formulated specific conclusions. This practice both allowed student thinking to be revealed to the class and required learners to justify their ideas in a logical manner (Diakidoy & Kendeou, 2001).

Examples of excellent questioning ability and responsiveness to the answers solicited by highly skilled literature teachers provide additional exemplars of pedagogical skill. Specifically, these teachers weaved their instruction around queries on the literal meaning of texts, the connotative meaning (e.g., what does a weeping willow suggest?), the interpretive meaning (e.g., what do these symbols say about the author’s state of mind?) and the application of relevant ideas (Shulman, 1987). Such skillful questioning facilitated growth in students (Ball, 1990; Shulman, 1987).

Furthermore, teachers skilled in pedagogy have demonstrated deft ability to accommodate student needs. For example, Jere (1986) asserted that highly skilled teachers provided more active instruction and redundancy for low achieving students and more warmth for students of low socioeconomic status (SES) who may have felt disconnected from the school environment. This is why knowledge of child development and cultural diversity is so critical to the development of teaching skill (Darling-Hammond & Bransford, 2005).

Pedagogical content knowledge

Pedagogical content knowledge is the capacity to transform domain specific information into powerful and adaptive versions that facilitate student growth and understanding (Shulman, 1997; Ball, 1990). Therefore, teachers who demonstrate such capabilities know the representation and organization of the content and they understand how learners with various ability levels learn that information (Mapolelo, 1999).

Accordingly, Hill, Rowan & Ball (2005) conducted a study to explore whether teachers’ specialized mathematical knowledge used to teach first and third grade math was significantly correlated with student achievement after controlling for salient teacher and student covariates such as race, culture and SES. They found pedagogical content knowledge on behalf of these teachers to be a significant predictor of student gains for first and third grade students (Hill et al., 2005).

The difference between subject area understanding alone and pedagogical content knowledge is illustrated by this passage: “Although some teachers have important understandings of the content, they often do not know it in ways that help them hear students, select good tasks, or help all of their students learn” (Ball, 2000, p.243). In other words, many teachers understand concepts but cannot explain them to their younger, less experienced students. Also potentially problematic is the subject savvy teacher who cannot adapt textbook information to meet their students’ needs, who may omit salient conceptual ideas, who passes over teachable moments, and who modifies ideas in a manner that distorts their true meaning (Ball, 2000; Jere, Glaser & Takanishi, 1986).

Questionnaire and interview data culled by Ball (1990) of prospective mathematics instructors revealed that teacher candidates were able to competently solve math problems yet few could generate accurate representations of what they knew, illustrating the difference between subject matter understanding and pedagogical content knowledge.
In fact, of the 35 mathematics majors who participated in this study on the quality of their domain-specific understandings, only four (11 percent) could describe an appropriate representation of $1 \frac{3}{4}$ divided by $\frac{1}{2}$. Twelve of the 35 prospective teachers created representations that did not correspond to the problem, and most saw the question as one about fractions, not division. In addition, most could not see the difference between division by two and division by one-half. This is problematic for obvious reasons. Teachers cannot help their students learn math if they themselves are confused. Also disturbing is the finding that 19 of the 35 math majors could not generate a representation for $1 \frac{3}{4}$ divided by $\frac{1}{2}$ (Ball, 1990). This exemplifies the difference between simply performing calculations correctly and doing so according to the principles that underlie such computations.

Innovative lesson plans conferred to teachers did not seem to compensate for compromised pedagogical content knowledge. For example, teachers who were given a set of “effective” science lesson plans to follow found their teaching resulted in student confusion (Schauble et al., 1995). Specifically, a set of teachers were told to follow lessons requiring their students to make boats out of foil as a way to learn how to design real boats. As per the lesson scheme, the teachers moved immediately from a discussion on the need for vessels with an abundant carrying capacity to the concrete task of modeling different boat designs made of aluminum foil. Yet none of these teachers discussed what creating model aluminum foil boats had to do with making real boats (Schauble, 1995). This key pedagogical error, made despite the provision of lesson plans, reveals how easy it is for teachers to forget to discuss the relations between objects and procedures in an experiment, why those objects and procedures are used and what aspects of real life they can, and cannot, represent. If teachers lack perspective taking ability and are not cognizant of their students understanding, developmental level, typical misconceptions and perspectives (i.e., pedagogical content knowledge), then their students may engage in decontextualized, largely irrelevant forms of experimentation and knowledge gathering (Schauble et al., 1995).

The challenge of teaching well is also not lessened by the provision of textbooks for instructors. Specifically, typical texts feature rote procedures on the Scientific Method or formulaic mathematical concepts that do not facilitate comprehensive student learning of such processes. Substantive learning of concepts occurs when students engage in real investigations or build elaborated schemes of those ideas over time (Schauble et al., 1995). In other words, learning disembodied skills or the rote meaning of technical ideas from texts does not enable students to understand how to construct an elaborate scheme of specific academic topics or of the world (Schauble et al., 1995). For students to truly learn conceptual information, the teacher must be able to repeatedly perform online diagnoses of pupil understanding, pose questions within the students’ zone of proximal development, and encourage the use of inquiry. In addition, teachers need to capitalize upon teachable moments by opportunistically seizing the students’ capacity to reason logically. All of the tasks just mentioned require high levels of pedagogical content knowledge, which cannot be derived from a domain-specific textbook or generic lesson plan scheme.

Again, these and other problems occur because teachers who know content for themselves and/or know pedagogical approaches may or may not be able to use that knowledge in teaching. Thus, expert personal knowledge and an understanding of pedagogical techniques is a prerequisite but it is not a guarantee that one can unpack
elements of a domain and present it effectively to students (Kunsman, 1993). What does afford teachers such capability is the unique merger of content and pedagogical understanding into an embodied whole, equipping them to know what concepts are hard for students to learn, what representations are best to use when teaching certain ideas, and what are optimal ways to develop conceptual understanding.

Inherent therein is an instructor’s capacity to discern what their students know, to pose effective questions, to manage class discussions and to explain curricula to parents. For example, metaphors such as “take away” and “borrowing” can confuse students who are learning subtraction, yet most mathematicians, who are clearly adept at subtracting numbers, probably do not know the flaws of these metaphors (Ball, 2002). That is because pedagogical content knowledge includes ways of making domain specific knowledge accessible to others. This is qualitatively different than the linear addition of content knowledge and pedagogical understanding.

Another study was conducted by Mapolelo (1999) on three student teachers in Botswana, Africa in an attempt to examine whether mathematical competence and theoretical knowledge of pedagogy among prospective teachers would lead to effective instruction. Specifically, the teaching and reflections of practice on behalf of three student teachers, recognized as outstanding in mathematics according to two valid mathematical exams and professor recommendations, was analyzed (Mapolelo, 1999). Results showed that the three participants had difficulty changing their instructional trajectory extemporaneously in response to student need, they had difficulty explaining the mathematical concepts to their students, and they lacked the capacity for self-evaluation. For example, one student teacher said, “The lesson plans are too long. We do not have time to research the topics we are going to teach. I think we should be making brief but detailed lesson plans and then have some time to research. This may help us teach better” (Mapolelo, 1999, p.720). Finally, one student teacher was surprised by the inaccuracy of her student appraisals. Specifically, she said, “Children know formulas for finding the area of different shapes. I think it will be easy for them to see the relation between area and volume of shapes.” Later the same student teacher said, “I was surprised that most children were not sure of the difference between volume and area of shapes. They even used the same units of measure for these concepts” (Mapolelo, 1999, p.721). Accordingly, lesson presentations on behalf of these student teachers were less comprehensive and more procedural as opposed to conceptual.

Another revealing finding from the study mentioned previously and conducted by Ball (1990) of 35 math majors was the epistemological beliefs shared by prospective teachers on the nature of explanations. Specifically, almost all participants in the study believed that the rules and facts for mathematics were the explanations (Ball, 1990). Secondary teaching candidates tended to recall the rules better than their elementary counterparts, and these participants explained concepts such as division by zero as, “it’s undefined” (Ball, 1990, p. 460). At no time did these teaching candidates feel it was necessary to understand why dividing by zero is undefined, yet this causative information is the heart of an instructional explanation (Ball, 1990).

Limitations in teaching effectiveness have been exhibited by prospective math teachers who are knowledgeable about and endorse the use of constructivist pedagogical approaches and who would be deemed “highly qualified”, as per their results on Praxis subject area certification exams. Specifically, new science teachers, who again, explicitly
expressed an interest in using student-centered teaching approaches, continued to use more teacher-centered curriculum and instruction. This was attributed to a lack of pedagogical content knowledge (Bianchini et al., 2003). In addition, student teachers failed to explicitly teach what they wanted students to learn about the nature of science. Instead they hoped students would learn such information implicitly through engagement in scientific activities (Bianchini et al., 2003).

This cadre of new teachers attributed their difficulties to the following set of circumstances: California state content standards do not explicitly discuss the nature of science, it is hard to address all standards and engage students in a critical dialogue, it is challenging to find a balance between content and process, and implementing activities on scientists takes too much time away from covering state content standards. Additional attributions for difficulty articulated by the new teachers included problems merging standardized test preparation with innovative assessments and confusion regarding how much of the learning should be student-directed (Bianchini et al., 2003). For example, one student teacher reported having trouble getting all of her students to listen to their peers and work in groups when another said she could not describe why particular phenomena occur in geology because time did not permit her to really explain these scientific ideas.

Such constraints and challenges unequivocally affect the instruction on behalf of novice and more experienced, competent teachers. Pedagogical content understanding however, equips instructors in their attempt to reconcile externally mandated requirements with student-centered goals such as the cultivation of an elaborate, conceptual knowledge base (Ball, 2000). Japanese educators find pedagogical content knowledge to be of great importance, leading them to include such information in their lesson plans. Specifically, Japanese lessons contain the questions that should be posed to students, a list of frequently encountered incorrect and correct student replies, and descriptions of how teachers can exploit such responses so as to increase student understanding (Darling-Hammond & Bransford, 2005). First and fifth grade students in Japan are also exposed to more conceptually substantive mathematical instructional explanations in comparison to their American counterparts and the former show greater achievement gains in that subject (Perry, 2000). Thus it is very possible that the provision of conceptual explanations that answer the question “why” facilitate the growth evidenced by Asian learners.

Examples of teacher expertise. Examples of teacher expertise in the academic literature have been provided by many theorists who describe well-executed math lessons, physics lectures and history lectures (Leinhardt & Smith, 1985; Geelan, 2003; Teagust & Harrison, 2000; Lampert, 1986; Horwood, 1988; Leinhardt, 1993). Specifically, Geelan (2003) researched whom students felt was an excellent teacher in their Australian high school. It is reasonable to assume that those who were deemed excellent in their field were most likely operating at a level close or equivalent to that of an expert. In this instance, excellent was operationalized as: a person whose former student’s academic achievement was exemplary and a person who was nominated for this status by his/her peers.

Mr. Richardson, a secondary school physics teacher, was granted such an honor. Specifically, this teacher spent 95 percent of his teaching time lecturing in front of the room (Geelan, 2003). He submitted questions to his students and checked for pupil understanding, yet the bulk of his time was spent explaining concepts clearly to his class. The explanations that he disseminated were peppered with student directed queries.
pertaining to “what” will happen in physics and “why” (Geelan, 2003). Furthermore, Mr. Richardson regularly drew upon prior student knowledge by articulating a mental model of the dynamics he described. When students verbalized fragmentary answers, this teacher either submitted the missing data himself or asked additional questions in an attempt to elicit a more elaborated answer. If some pupils still did not understand salient concepts, this teacher rearticulated the material in other ways. In essence, this teacher regularly provided clear, logical explanations that were intelligible to his student population (Geelan, 2003). Accordingly, Mr. Richardson verbalized approximately 160 words per minute or 95 percent of the total number of terms spoken in this classroom over the course of fifteen hours. The remaining verbalizations were conveyed through student presentations and responses to questions posed in class (Geelan, 2003). The practices just described are not meant to be prescriptive and if re-executed by another less competent teacher, may lead to mediocre student outcomes. Nonetheless, each account of excellent pedagogical practices illustrates what it is that teachers must learn how to do.

The noted physicist, Richard Feynman, was also known for his ability to construct and disseminate expert pedagogical content explanations in physics (Teagust & Harrison, 2000). Consequently, his traditional and lecture based teaching was deemed highly effective in fostering student understanding. Specifically, Feynman's macro-explanations were composed of micro-explanations, many of which included examples, metaphors, analogies, models, and sometimes anthropomorphic and teleological explanatory information. In essence, Feynman explained concepts deftly because of his masterful understanding of the subject matter and his ability to translate that data into intelligible information that his student population could understand (Treagust & Harrison, 2000). Thus, this professor enacted his role with penetrating conceptual knowledge in tandem with strong pedagogical content knowledge.

For example, this professor called paramecia “small football shaped things”; water molecules were deemed similar to “a crowd at a football game”: these were all analogies that the students could relate to and that did not adulterate or distort the essence of the physics concepts communicated. In addition, each explanation was enhanced by Feynman's ability to cleave out irrelevant details when weaving a web of conceptual understanding. This capability stood in contrast to the novice teacher, who disseminated the entirety of a data set in a linear, rigid fashion. Finally, Feynman also displayed excellent metacognitive capabilities in that if he could not convert abstract theoretical knowledge of physics concepts into information that would be intelligible to novices, then he felt this revealed compromised understanding on his behalf (Treagust & Harrison, 2000).

The information extrapolated from Feynman's exemplary teaching enables one to conclude that the efficacy of lecture-based teaching is in part a function of the explanation presented; if the classroom explanatory information is rich, logical, parsimonious, creatively articulated and illuminated with metaphors, analogies and models, then the students are likely to gain much from hearing them. Thus, it is clear that some lectures are unequivocally effective due to high explanatory cogence and student accessibility, made possible by pedagogical content knowledge.

Pedagogical content knowledge can be noted in equal detail when analyzing effective whole-class discussions. Leinhardt (1998) depicted the process of meaning making between high school students and their teacher, through the presentation of a
diagram that represented one segment of an exemplary collaborative history explanation. The expert history teacher did the following: articulated the core query, provided scaffolds so students could comprehend the question in an elaborated manner, summoned evidence, connected data from the past to the present, summarized, and solicited examples that revealed why historical processes were constructive and necessary. Interestingly, some of the students provided their own explanations in an open discussion, and these student-generated answers, modeled after their teacher’s explanatory use, included analogies, integrated collections of facts, and references to the initial statement. Hence it was clear that students in this class demonstrated competence when constructing their own instructional explanations and this was a function of modeling the same behaviors on behalf of their teacher.

Another example of expert pedagogical content knowledge was illustrated by a mathematics lesson on the five planes problem (FPP). Specifically, in 1965, George Polya skillfully taught this lesson to a group of Stanford University undergraduates. Included in his lesson was a presentation of the methods used for effective guessing. Polya’s teaching segment was filmed and analyzed by Leinhardt & Schwarz (1997) so that the epistemological and pedagogical ideas reflected in his practices could be distinguished and described. It is important to note that this was lesson not part of a real course rather it was used to demonstrate George Polya’s theories about teaching math (Leinhardt & Schwartz, 1997).

Polya did many things to facilitate student learning in accordance with the constructivist learning paradigm. First, he used one and two dimensional problems, visual representations such as cheese drawings, the blackboard, and a tetrahedron (solid geometry representation), as well as a table to coordinate multiple, connected representations of the same concept. The three analogs were understandable to this audience and were meaningfully elaborated on by the use of two to four representations for each (Leinhardt & Schwartz, 1997). For example, the cheese representation was used as a way to visualize the five planes as slices through space. To that end, he moved a yardstick through the air to simulate the movement of a knife, and further illustrated these dynamics by using precise terms such as “cut, sharp, and many pieces.” (Leinhardt & Schwarz, 1997, p. 404). As he sliced through with one plane, he asked students to guess the result via mathematical, not colloquial means (which was a dichotomized set of two pieces). Following this, he asked what would happen if a second cut penetrated the cheese, so that students could learn the process of educated guessing and use this heuristic to solve the FPP. Then Polya utilized the solid geometry representation or a solid wood tetrahedron coupled with a drawing of this figure formed by four planes (Leinhardt & Schwartz, 1998). As he proceeded through the same process of student induction he recorded all ideas regarding the number of parts associated with each plane on a two-column numerical table. This enabled the students to view their counting and inductive activities across analogs; in addition, the variance in answers revealed the nontrivial nature of FPP. In response to such complexity, all of these concepts were simplified by Polya’s use of a one and two dimensional analog, lines and planar regions on a plane and points displayed on one line, respectively (Leinhardt & Schwartz, 1998).

George Polya’s ability to facilitate the use of induction by observing patterns, transforming the problem into simpler representations, use of analogies, and testing guesses was impressive. Also, Polya chose conceptually accurate descriptive analogs and
correlated representations that illustrated key ideas without confusing the students or
distancing the course of learning from main elements (Leinhardt & Schwartz, 1998). The
complexity and dynamics of FPP was reflected by the students’ inductive responses. At no
time did Polya lecture or didactically inform the learners of what he wanted them to know.
Even Polya’s choice of language, which clarified each analogical representation, was precise
and did not detract from the logic of this problem (Leinhardt & Schwartz, 1998). In sum,
this instructional episode, as well as the others mentioned, reveals the practices and
procedures on behalf of those who teach and who possess pedagogical content knowledge.

How then, is knowledge of effective teaching learned? In part, such knowledge is
gained through participation in the student teaching experience. As teachers-in-training
watch their cooperating teachers calibrate practices and materials in response to student
need, they learn how to enact similar pedagogical practices (Borba, 2008). Skill is further
solidified as experienced educators observe those who are in training, so all parties can
reflect on these shared experiences. Informing this co-construction of knowledge is the
linkage of theory with practice, serving to strengthen the preservice teachers’ grasp of
each.

The Student Teaching Experience

Definitions of the student teaching experience illustrate the parameters of this facet
of teacher training. The State of New Jersey defines the student teaching experience in the
following manner. “School districts have a responsibility, as part of the continuum of
professional education and development, for accepting and placing student teachers. This
shall be the equivalent of a full-time experience of one semester’s duration and shall be
included within the professional component. The student teacher shall be under the direct
and continuous personal supervision of an appropriately certified cooperating teacher.”
definition constructed by the National Certification Agency for Teacher Education (NCATE),
a school of teacher education accreditation agency, states the practicum is “a prearranged,
structured learning experience, scheduled within a specific timeframe and related to the
student’s academic and professional goals. Students work in consultation with a faculty
member or college practicum instructor as they develop critical thinking skills and
leadership abilities while performing authentic tasks. Students gain work experience and
bridge the gap between course work (theory) and the work place (practice) in a practicum
program. Students acquire real-life technical experience, skills, confidence, and knowledge
in authentic environments. Student teaching or an internship is the culminating experience
for teacher candidates at the baccalaureate level” (http://www.ncate.org/documents/standards/NCATE%20Standards%202008.pdf)

Student Teaching Syllabi. What the teachers-in-training will actually do varies
according to the syllabi and the K-12 context in which the perservice teacher is placed.
Nonetheless, most student experiences “encourage [students] to engage in any or all of the
following activities:

- observe the cooperating teachers lessons and model that behavior
- create classroom materials
- create classroom learning centers
- teach an entire class lesson and/or teach in small and large groups
• self-evaluate or require student teachers to describe their own perceptions of “how things went” after teaching a lesson
• construct a goal for improvement to be consolidated over the upcoming week
• prepare plans for all lessons carried out
• supervise on the playground and at lunch
• correct papers
• use audio visual aids
• participate in a parent conference
• create a unit in different areas of instruction
• align the classroom floor plan/create bulletin boards
• participate in the creation of student Individualized Education Plans
• observe lesson(s) presented by other faculty members
• gradually assume all or almost all teaching responsibilities (Description and Guidelines for Practicum in Education, 2008; Krueger, 2006)

Lessons Uniquely Learned in the Field

Connecting Theory and Practice

Theory sits unevenly against practice. Authentic contexts function according to those policies and procedures that are in alignment with local social norms and the ideology therein. Social and ideological variables are derived from parents, school leaders, and pre-existing teaching staff. All, to some degree, affect what students’ learn. This makes learning about how pedagogical practices endorsed by the academic literature base are implemented in the real world of great importance when training teachers.

Examples described by prospective middle school teachers’ field experiences, as well as those on behalf of perservice teachers working in numerous other classrooms, illustrate the qualitatively unique information learned when working in real world settings. Specifically, those who have had more varied field placements enter the profession with much more realistic perceptions of the challenges faced by teachers of middle school students (Moore & Leonard, 1990). This may serve to explain, in part, why teachers who student taught reported higher levels of job satisfaction, in comparison to their peer with no such experience. In addition, those who student taught were also more confident in their capacity to positively alter student learning. Finally, higher levels of student teaching supervision were associated with a greater wish to remain in teaching, revealing the degree to which those who miss multiple opportunities to work in the field commence their new roles at a disadvantage (Oh, Ankers, Llamas, & Tomyoy, 2005).

Admissions staff from an art educator training program began mandating participation in field experiences as part of the application process. This was done so admissions staff could determine the degree to which their applicants’ realistically wished to work in the classroom (Henry & Lazzari, 2007). Specifically, prospective students were required to spend fifty hours in K-12 classrooms in two different contexts. Reflective notes on the experience served as a portion of each prospective student’s admissions packet (Henry & Lazzari, 2007).

Analyses of other experiences in the field reflect its value in concretizing that which was learned in the university context. Ross, Hughes & Hill (2001) explored the definitional knowledge and ability to recognize new application of key concepts in Educational Psychology, in an attempt to discern if linking theory to experiences in the field enhances
learning of the former. Outcomes were compared between those who learned Educational Psychology theories in the traditional university setting with those who received the same instruction but also participated in twelve hours of applied experiences. The twelve concepts to be learned were: "positive reinforcement, negative reinforcement, punishment-1, punishment-2, Premack Principle, secondary reinforcement, classical conditioning, operant conditioning, test validity, extinction, criterion-referenced testing, and norm-referenced testing" (Ross et al., 2001, p.104).

Those who searched for applications of these concepts in the field demonstrated superior definitional understanding, in comparison to those who were taught the same content in the university context alone. This suggests that the merger of field experiences with theoretical, university-based learning not only has the potential to enhance applied practice, but also to fortify knowledge schemes of relevant theories (Ross et al., 2001).

Results from a case study lasting a year also reveal development of thought processes and beliefs among preservice reading teachers as a function of their placement in the field (Linek, Sampson, Raine, Klakamp, & Smith, 2006). At the most basic level, these preservice teachers had a much more differentiated, complex understanding of all aspects of pedagogy as their training continued. Five categories of pedagogical practice emerged as noteworthy to the participants, as per the qualitative data. These were: matching instructional materials in a manner that met the developmental needs of the children, deftly managing time during a lesson, effectively managing behavior, continually monitoring personal practice, and proficiently modeling the task required for students to practice and learn (Linek et al., 2006; Mc Glamery & Harrington, 2007).

Factors contributing to this understanding include: recognition of effectual and ineffectual practices, monitoring student needs and acting accordingly, and valuing the theoretical underpinnings of effective practice learned at the university (Linek et al, 2006). Thus, reflection, authentic practice, scaffolding by a more skilled other, and the university/public school connection are integral components of teacher preparation.

**Critical Incident Analysis**

"Critical Incident Analysis" has been described as a powerful method for constructing ideas about real issues in classroom context as a preface to student teaching (De Schon Hamlin, 2004). This analysis requires preservice teachers to cite problematical pedagogical practices and discern how each could be handled differently. The field experience provides a unique opportunity to engage in "Critical Incident Analysis" because the stressors of personal evaluation do not constrain their analyses. For example, one student performing such an analysis noted a teacher’s caring attitude towards those in her English is a Second Language (ESL) class. This stood in contrast to the same teacher’s lack thereof towards her pupils in a remedial course. Observing this highlighted for the student observer the way that teacher attitudes can, potentially reciprocally reinforce student performance (De Schon Hamlin, 2004).

**Reconciling Teaching Goals with Practices**

Goals on behalf of preservice teachers sometimes prove to be discrepant from outcomes. This dissonance can be revealed and examined during the student teaching experience. For example, Britzman (2001) reported the construction of objectives that included facilitating student awareness of personal identity in the interpretation of history and literature. Limits however, which were realized when working in a realistic context, thwarted the realization of those goals (Britzman, 2001).
To expand and explore such tensions, student teachers of English were asked to center their focus on how “positions of power and desire are constructed in literature and in the student’s world” (Britzman, 2001, p.66). To that end, one student teacher presented Barthes’s codes that are defined as hermeneutic, cultural and communicative, referring to ones’ subjective questioning and problem solving, knowledge of people and place, and structure of talk, respectively. This lens was used as means through which to view a naturalist story entitled, “Like a Winding Street”, written by an African-American woman (Britzman, 2001).  

During this lesson, issues of class, race, gender, power and desire were revealed. Students then felt reluctant to talk about their views in the face of such controversial ideas. Unpopular things did eventually rear their heads in class discussion, without disorganizing practice. This taught the preservice teachers how to examine preexisting realities in an attempt to unveil possible ones (Britzman, 2001). 

Other discrepancies between preferred pedagogical techniques and actual practices have been revealed to practitioners-in-training through the experience in the field. For example, those teachers who endorsed student-directed learning frequently defied those assertions by instructing in a more teacher-centered manner (Hancock & Gallard, 2004). These challenges emerge, because the authentic demands of teaching are not always completely synchronous with theories regarding optimal practice. Intrinsic to learning “how to teach” seems to be the process of achieving theoretical and practical reconciliation. This is because practice is enacted in complex, reciprocal environments, making it both an art and a science. Through this recursive process, and active reflection of the applied experience itself, personal dispositions are recognized and identity as a professional practitioner develops (Hourigan, 2006; Hancock & Gallard, 2004). 

Fortunately, teachers’ beliefs still serve as the central sources of information in determining what pedagogical practices they will most likely implement. When a lack of symmetry exists between belief and practice, this finding has been attributed to a set of common factors (Chen, 2008). These include: truncated conceptual knowledge of theoretical constructs on behalf of teachers; teachers harboring beliefs that are in conflict; and the force of external factors that trump teachers’ ability to practice in accord with their views on best practice. Thus, understanding pedagogical beliefs is inextricably connected to knowledge of the teaching context and the influences therein. For example, a physics teacher stated, “If I skip some content, the students will think I neglected my duty. ….If the students fail to answer the relevant questions while taking exams, their parents will call administrators to complain” (Chen, 2008, p. 72). Most susceptible to alteration are peripheral beliefs. 

To reveal the degree and type of discrepancies that exist with respect to pedagogical techniques on behalf of science teachers-in-training, sixteen were asked to draw their future classroom teaching experiences. Five were interviewed more intensively and assessed via case study research. This investigation revealed a dualistic view of teaching, where in some instances the teacher facilitated student directed learning and in others, the teacher transmitted relevant information to students seated in rows, listening to lectures. Again, attending to these tensions requires a repeated, continuous cycle of critical reflection. Contemplation of these polarities can facilitate conceptual and practical consistency (Hancock & Gallard, 2004).
A similar situation was noted by mathematics educators in Hong Kong. Traditionally, in that area of the world educators adhered to the Confucian views on cultivating skills, which were nurtured through drills and disciplined practice. This stands in contrast to the newly espoused Western movement, which uses constructivist pedagogy (Ng & Rao, 2008). Mathematics educators who have watched videotapes of their teaching state, “...My classroom practices are not the same as my thinking...” (Ng & Rao, 2008, p. 168). Yet the discrepancy between their newly cultivated constructivist ideology and traditional Chinese practices centered on discipline and self-control, are attenuated. The classroom videos of pre-primary and primary school classrooms indicate that play, the use of manipulatives and “meaningful learning” were being utilized, just not to the extent Chinese educators espousing constructivism had hoped. This reveals the power of beliefs in influencing practice, as well as the influences of school and parental pressure, past cultural beliefs, and the time it takes for teachers to transform their thinking (Ng & Rao, 2008).

Through the process of reflectively writing about student teaching experiences, teachers-in-training can develop, and subsequently enact, the types of sound practices born of problem solving strategies (McGlamery & Harrington, 2007). Practice driven by thought and not automatic responses derived from past experience is a prerequisite for effective instruction. In addition, the process of thinking critically about practice is an invaluable habit of mind for those who will be high caliber professionals and lifelong learners (McGlamery & Harrington, 2007).

Examples of reflective practice include: A teacher candidate ran out of time and she omitted the “closure step” of the lesson. She lamented her choice, realizing that student retention may have been compromised as a result. Next time, she decided to review information and detailed that which she would have discussed if she had carved out such time (McGlamery & Harrington, 2007).

**Teaching Diverse Learners**

Attending to the real diversity in classrooms is also understood more clearly as a function of time spent in the field. Specifically, Colby & Stapleton (2006) report that students training to teach a Writer’s Workshop found the work with individual learners to be the least difficult aspect of the experience whereas whole-group instruction proved to be the most challenging. Specifically, some preservice teachers found planning for diverse needs, scaffolding slower learners, and redirecting those who lost focus on the lesson, to be formidable tasks. Also realized was the value of giving students choices and space to be creative. The rewards gained from increasing student autonomy and intrinsic motivations were happily surprising to behold (Colby & Stapleton, 2006).

Additional experiences as classroom managers taught the teachers-in-training to consistently reinforce the rules or expect to be confronted with disruptions. This made the theory of consistently reinforcing classroom reward and consequence structures more than a concept – it was a reality (Colby & Stapleton, 2006).

The salience of interacting with exceptional learners when engaged in teacher training cannot be understated (VanWeelden & Whipple, 2005). Doing so can facilitate the cultivation of positive attitudes towards disabled learners. It can also allow preservice teachers to feel greater readiness to enter the classroom because they have already
confronted the special needs of disabled students in an authentic educational context (VanWeelden & Whipple, 2005).

Populations of learners in the United States are increasingly diverse, yet the majority of teachers are a homogenous group of white females. This would not be problematic if those soon entering the teaching profession had experience and knowledge of diverse cultures however academic research has shown that this is not the case (Downey & Cobbs, 2007). Instead, many do not understand the cultural norms and knowledge base of those who they will teach. This greatly compromises their ability to enact their roles optimally and with attunement (Downey & Cobbs, 2007). In addition, students in university settings who do not have an opportunity to interact with diverse learners often harbor and retain stereotypes of minority students that constrain teaching possibilities (Phillion, Miller, & Lehman, 2005).

Thus, teachers-in-training should be provided with opportunities to examine what stereotypes and thought processes color the expectancies they have regarding what their students can achieve. Accurate understandings of ones future students can be constructed by asking, “What differences in dialect mask what students really know and understand? How can culturally relevant materials be used in a pedagogically sound manner?

In an attempt to answer these questions, teachers-in-training were assigned to one of two conditions. Both were required to complete 75 hours of classroom experience and tutor a student struggling with math over the course of three occasions. The second group however, was asked to tutor a student from a background different from his/her own, interview this student about his/her perspective on learning mathematics, and complete a guided reflection (Downey & Cobbs, 2007).

The interview yielded the following new understandings on behalf of participants: attending to student learning should not be eclipsed by an emphasis on teaching performance, students often do not ask questions when they are confused, hearing students voices is invaluable when seeking to learn about their thinking and struggles, and finally, interviews revealed the resources available in the extended community to support student learning (Downey & Cobbs, 2007).

Realities of High-Stakes Test Preparation

Working in the field reveals the tensions between using testing to ensure that disadvantaged learners are not left-behind, and the pedagogical constraints these mandates impose on classroom teachers in urban settings. Specifically, high-stakes test preparation frequently trumps vital emphases on attending to diversity issues (Margolis, 2006). Thus, the theory behind instituting No Child Left Behind (NCLB) mandates to close the achievement gap, instead serve to redirect attention towards technical, suboptimal teaching to the tests themselves. These practices constrain the use of culturally responsive pedagogy. As long as effective teaching is equated with student test performance, diverse student needs will remain subsumed by assessment goals (Margolis, 2006).

Mastering School Complexity

Teaching is anything but formulaic. This is, in part, due to the complexity of schools. Specifically, the several gears that comprise school contexts turn at different rates, collaboratively or antagonistically, beneath a unique stratum of leadership and mobilization (Fullan, Bennett, & Rolheiser-Bennett, 1990). Dilemmas, tensions, and contradictions emerge due to shifts in power, boundaries or other variables. Various cogs
in the wheel include classroom content, instructional strategies, instructional skills, and classroom management. Also included is the teacher's technical repertoire, the teacher as researcher, the teacher as a collaborator, and the teacher's reflective practices. Additional gears include school collegiality, the cultivation of shared purpose, a commitment towards continuous improvement, and the health of the structure therein (Fullan et al, 1990). The degree to which all facets of this framework are optimal and function smoothly determines the efficacy of the school. Understanding the architecture of these systems can be best achieved through spending time working within them.

Training Methods for Those in the Field

Teacher Work Sample

As a means for thinking about and effectively managing the challenges and complexities of student teaching, use of the Teacher Work Sample is presented (Devlin-Scherer, Burroughs, Daly & McCartan, 2007). This work sample includes pre and post-assessments of student knowledge, planning units, as well as reflections on what pedagogical practices, technology tools, cooperative learning procedures, scaffolds, and types of media presented, yielded the best results. Personal suggestions for future improvement and/or alteration of practice are included as well. This seems to be a method through which student teachers can engage in systemic analysis of practice, thereby leading to greater dexterity in accommodating student needs (Devlin-Scherer, Burroughs, Daly & McCartan, 2007).

Analysis of “Bumpy Moments”

Asking teachers-in-training to identify and examine “bumpy moments” has been proposed as a tool for facilitating reflection of observed classroom events. A “bumpy moment” is defined as a juncture during teaching, requiring the instructor to respond to a challenge confronted in practice (Romano, 2005). The problem should not be easily resolvable by the teacher, should be salient to classroom practice, and should play a role in how the class will proceed in the future.

Specifically, preservice teachers were asked to observe and take note of any and all bumpy moments observed when watching a practicing teacher. These observations were to be shared shortly after the observation, to preserve the verity of responses. No responses however, were to be divulged to the practicing teacher. Concurrently, the practicing teacher was to record the same perceptions and discuss this information with the interviewer promptly after class (Romano, 2005).

Agreement on bumpy moments only occurred some of the time – revealing the variance in perception on behalf of preservice and practicing teachers. For example, a practicing teacher named “Ms. Potter” was troubled by students entering the classroom late, thereby setting an unwanted tone for the day. “Jeanne”, the preservice teacher, did not detect this problem or its implications. Alternatively, “Jeanne” was disturbed by a student who called out after a clapping game had ended. “Ms. Potter” did not find that to be problematical, due to the normative nature of this conduct on behalf of the student and the cessation of the behavior after she gave the student a glance. Finally, on a half-day, “Ms. Potter” detected no bumpy moments, yet “Jeanne” perceived the entire morning to be bumpy. Clearly the expectancies on behalf of both parties differed and their perceptions of events varied in kind (Romano, 2005).
Again, it is suggested that examination and analysis of “bumpy moments” be a tool used to facilitate reflection among those observing seasoned teachers in practice. Also indicated is requiring preservice teachers to describe ways they had or could have influenced the outcomes of the moment. In addition, preservice teachers should be asked, what would you do if you were a teacher in this situation?” Both queries were added to the proposed protocol as a means for fostering concern towards relevant contextual variables, not readily attended to by an observer (Romano, 2005).

The Teaching Residency Model

College graduates interested in a long-term career in urban teaching are carefully screened, and if chosen, are provided with a yearlong paid residency under the auspices of a master teacher (Vaishali, 2008). This means that teachers-in-training are taught how to perform their craft by those with the highest levels of expertise, in challenging, high-need classrooms. Accordingly, the residency begins with qualified, committed teachers-in-training watching experts in action. Scaffolding continues so that residents who are tutored gradually assume more responsibility and upon program completion, become accomplished practitioners. Carefully constructed university coursework is provided during this process; some residency programs provide as much as eight weeks of summer coursework before immersing residents in a “tightly constructed yearlong curriculum” (Darling-Hammond, 2008, p. 732).

The Boston initiative, modeled after a medical residency, has trained multiple cadres of teachers. Results from this program are impressive, with a 90% retention rate on behalf of those residents who have taught for three years (Vaishali, 2008). Over fifty percent of the teachers from this group were from ethnic and racial minority groups.

The residency model is also cost effective. Recruitment for each resident equals $3,000, and preparation totals $30,000. Included within the final sum are an $11,000 student stipend, health insurance, and tuition (Vaishali, 2008). If however, residents leave the field before teaching for three years, a portion of their tuition must be repaid. This penalty incentivizes staying in the field beyond the three-year mark.

Field Experience via Video Conferencing

Students in university settings who do not have an opportunity to interact with diverse learners often harbor and retain stereotypes of minority students that constrain teaching possibilities (Phillion, Miller, & Lehman, 2005). To combat this, Internet video conferencing was used to link students from Perdue with those in East Chicago. Noted by students at Perdue were the high expectations on behalf of the teacher in Chicago and the impressive knowledge base displayed by the children. This drew many towards the idea of working in commensurate, urban contexts upon graduation. The only difficulties encountered were those of an audio and visual nature due to an overloading of the Internet and a lack of chronological synchronicity between verbalizations and viewed events (Phillion, Miller, & Lehman, 2005).

Peer Collaboration

Preservice teachers are asked to learn effective practice, in part, through closely watching their cooperating teachers. This practice however, does not always lead to analysis, contemplation and professional development (Anderson, Barksdale, & Hite, 2005). Why might this be so? First, those who observe the practices of exemplary teachers are not necessarily able to follow suit. The dynamic between the students and the model
teacher must be understood in order to create a similar circumstance (Anderson, Barksdale, & Hite, 2005).

To provide opportunities for repeated reflection and receipt of feedback while lessening the tension associated with evaluations elicited by school and university personnel, a peer coaching method was devised. This method can potentially have its flaws, especially in cases where peers are highly competitive or reluctant to provide feedback (Anderson, Barksdale, & Hite, 2005). Guided observation procedures help attenuate the problems mentioned, however the use of unguided observations can be equally useful so that observers can take panoramic snapshots of classroom dynamics.

Use of peer and cooperating teacher observation and evaluation seemed to be valuable in that is provided for the teachers-in-training depictions of what they should do, should not do, and may wish to do differently (Anderson, Barksdale, & Hite, 2005). The generative component of writing notes and thinking about specific practices seemed to facilitate the cultivation of an applied, more highly-differentiated knowledge scheme. It also seems that the repeated exposures to watching those engage in practice was much like being taught through a spiral curriculum, where concepts are introduced on multiple occasions. As time elapses and perceptions and corresponding practices become increasingly incisive and effective, the teacher-in-training becomes less of an apprentice and more of a skilled participant (Anderson, Barksdale, & Hite, 2005).

Role of Cooperating Teacher

It is clear that multiple facets of the authentic classroom context impact the practices utilized by teachers-in-training. The cooperating teacher’s techniques and beliefs both reflect and reinforce these dynamics, making their role of pivotal importance in the training of student teachers. In addition, cooperating teachers evaluate their student teachers, causing many preservice teachers to feel an obligation towards mimicking the practices and routines already established by their mentors. Research has shown most grades conferred to student teachers to be above average, yet this does not lessen the degree to which student teachers wish to please those under whom they work so they can secure positive recommendations and employment opportunities (Brucklacher, 1998; Chang & Ferre, 2001; Phelps, Schmitz & Boatright, 2001). In addition, procedures and pedagogical approaches utilized by cooperating teachers and their colleagues are contextually bound and culture driven, framed by the dialect, economic status, norms, and expectancies on behalf of students and their families. Accommodating to the context and assimilating the values therein can be a daunting process for even the most competent student teacher, especially when their personal backgrounds diverge from those on behalf of their students. Cooperating teachers can, potentially then, bridge this divide, further highlighting their importance to teachers-in-training (Kruger, 2006).

Cooperating teachers also dictate the degree to which student teachers can “take up space” and integrate their pedagogical beliefs in their mentors classroom. Some cooperating teachers recognize and introduce their student teachers as “coteachers”, which often lends the apprentice much credibility. Similarly, some student teachers have been called team-teachers, which is also emblematic of a relationship on “equal footing.” Taking up space by having an actual workstation also enables the novice teacher to have a private area for the enactment of their role as fully-qualified interns. Thus, authority, status, and support or lack thereof are all conferred to student teachers by their cooperating teachers, and this strongly impacts the quality of their apprenticeship and what they learn.
Conclusion

In summary, the analysis of “Bumpy Moments”, the “Teacher Work Sample”, video conferencing, teacher residencies, and peer collaborations all serve as examples of student teaching and field experience training methods. Every technique is similar in that all reveal the importance of framing and addressing educational problems that are embedded in practice (Beeth, & Adadan, 2006). University-based courses as well as the practices used by cooperating teachers themselves, play a pivotal role in facilitating productive reflection on behalf of those engaged in the field and student teaching experience. This reiterates the value of tightening curricula and examining the practices used by cooperating teachers so that pivotal aspects of teacher training and their influence on student teachers can be further understood (Beeth, & Adadan, 2006).

References


