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An Investigation into How Measures of Student Teacher Performance that Indicate Developmentally Informed Practice are Related to a Measure of Overall Student Teaching Proficiency at a Private Northwest Comprehensive University

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DISSERTATION

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Abstract

Indicators of the proficiency of teacher candidates at applying knowledge of child development to teaching and learning was examined to see if they predict the overall success of the candidates full-time student teaching. The assessment instrument, the Full-Time Student Teaching Summary Report (FSTSR), was found statistically reliable and suitable for further analysis. While it was found that selected measures of student performance, when taken together, significantly predict 92% of the score of overall student teaching performance, it was also found that this may be misleading because of the problem of multicollinearity in the predictor variables. A secondary hypothesis was formed that the underlying structure of the FSTSR measured only one central property. A factor analysis did not support the single factor hypothesis. The thirty-nine items on the FSTSR statistically cluster around three factors, identified as 1) classroom teaching, 2) professional dispositions, and 3) enlist and facilitate student support. Fifty-six percent of the items on the measure cluster around the first factor designated as "classroom teaching". Most of the items on the assessment instrument are measuring, for the most part, a central property identified as classroom teaching. While the independent variables significantly predict the criterion, there is little confidence that they are measuring developmentally informed practice. Suggestions for modifying the measure to make it more meaningful are discussed.

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Chapter One: Introduction

This study is a local response to a national concern. In 2008, a group of experts in teacher education and human development gathered at the National Institute of Health headquarters in Bethesda, Maryland. They met to continue their efforts to translate what is known about child and adolescent development into principles of good teaching. The group began to meet in 2005 (Pianta, Snyder, Hitz, West, Zelman, et al., 2010). After their first two meetings, they released a roundtable report, which stated:

> Application of the research and knowledge base about child and adolescent development is the missing element in most teacher preparation programs. It cannot be assumed that teacher candidates will automatically be able to transfer information to classroom practice; they must be shown how. (Eunice Kennedy Shriver National Institute of Child Health and Human Development & National Council for the Accreditation of Teacher Education, 2007, p. 2)

According to Ritchie, Maxwell, & Bredekamp (2009), the gatherings of this expert group were directly connected to significant criticism of teacher preparation programs in the United States for a failure to demonstrate the ability to help teachers apply theories of learning in practical ways in the classroom. They note, for example, a report by the U.S. Office of Post-Secondary Education that asserts that the evidence linking teacher's cognitive ability, experience, and content knowledge to teacher effectiveness is much stronger than the evidence that training in pedagogy and field experience is linked to student achievement (U.S. Department of Education, 2003).

More recent remarks, by U.S. Secretary of Education, Arne Duncan, indicate a growing dissatisfaction with the effectiveness of U.S. teacher preparation programs. He states: "The programs are heavy on educational theory—and light on developing core area knowledge and clinical training under the supervision of master teachers" (2009a). Duncan believes that "by

almost any standard, many if not most of the nation's 1,450 schools, colleges, and departments of education are doing a mediocre job of preparing teachers for the realities of the 21st century classroom" (2009b). Even before these statements by Duncan, Cochran-Smith noted that recent attention and emphasis on teacher quality was "unprecedented" and that United States teacher education had become "one of the hottest topics in the public and academic discourse" (2008, p. 271).

In the midst of this attention, the National Institute of Health and Human Development (NICHD) and the National Council for the Accreditation of Teacher Education (NCATE) began to gather to converse about the "missing element" of helping candidates connect their knowledge of child and adolescent development to practice in the classroom. The NCATE national expert panel recently released a summary document, called *The Road Less Traveled*, which includes recommendations for various education and policy making communities (2010). The document was presented at a National Press Club briefing on October 5, 2010. At the briefing, Pianta summarized the intended outcome of the recommendations:

> The Developmental Sciences really are the stuff of education. We could argue that, in some sense, development is always happening and it's the job of educators to identify it, foster it, shape it, harness it, and intersect with it in ways that are intentional and strategic. (National Council for the Accreditation of Teacher Education, 2010)

Also at this briefing, NCATE President Cibulka voiced particular emphasis on assessment of applied developmental knowledge. He states, "I'd like to say that we very much agree with the panels recommendation that we need strong, rigorous assessments of the candidates knowledge, skills, and dispositions as they leave their programs." (National Council for the Accreditation of Teacher Education, 2010)

The interest of these national policy makers in the application of developmental knowledge to teaching is also evident in other mainstream educational communities. The Interstate Teacher Assessment and Support Consortium (InTASC) recently released a draft for public comment of their new recommendations for model core teaching standards (2010). The first proposed standard is titled, *Learner Development*, and states, "The teacher understands how children learn and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences." This standard is a clear statement of a strong point of view that it is the teacher's responsibility to apply knowledge of development to teaching and learning.

Additionally, at their 63rd annual gathering in San Diego in 2011, the American Association of Colleges for Teacher Education (AACTE) invited, as one of its major forums, a panel to discuss, "how the latest research in cognitive science and child development can improve student learning and how preparation programs can incorporate that research to produce more effective candidates (2010)." There can be no doubt that the educational application of developmental knowledge is a current hot topic in teacher education and education policy-making communities. There is fresh momentum to newly promote the old idea that encouraging teacher candidates to learn about human development and how it can be applied in their classrooms can make a significant difference in the education of children.

This idea should be investigated and the national emphasis on teacher preparation is motivation for teacher preparation professionals and researchers to seek data on the effectiveness of their profession. The conclusions by NCATE and NICHD, that teacher education is largely failing to help candidates connect developmental theory to classroom practice, led to the present

research proposal for a careful investigation of data from a decisive, end of program assessment, and to the following review of the research literature on in-service and pre-service teachers who have made connections between their knowledge of human development and their decisions and activities in the classroom. The goal of the literature review is to discover if the research literature identifies teacher education programs or individual teachers that demonstrate clear connections between knowledge of human development and teaching. What is the nature of the studies, if any, and how do the findings compare? Have efforts been made to measure the use of knowledge of human development in the classroom, or to make comparisons between teachers or classrooms where such connections are being made? What investigations have been made into the relationship between teaching practices that are developmentally informed, and overall teaching effectiveness or student achievement? What does the research literature say about the impact of a developmental perspective on teaching and learning in the classroom? These questions guided this investigation into the research literature.

A national climate that is critical of the effectiveness of teacher education at helping candidates to apply theory to practice, and in which major efforts are being made by national policy makers to respond to the criticism, leads teacher educators at a local level to investigate available data that may indicate how teacher candidates are doing at applying theory to their practice, and what relationship this may have to the quality of their teaching in the classroom. This study is a local response to a national concern. It is intended that this study will inform continuous improvement efforts in local teacher education.

The School of Education at one private northwest comprehensive university has a teacher candidate population that has been similar, in candidate numbers, to several larger institutions in the region who also offer teacher preparation (National Center for Education Statistics, 2010). The

teacher preparation program uses a measure to assess student teacher proficiency called the *Full-Time Student Teaching Summary Report* (FSTSR). This investigation was a secondary analysis of existing data from FSTSR assessments that were completed between the fall of 2005 and the spring of 2008. Both university supervisors and cooperating teachers use the FSTSR to assess each candidate near the end of their full-time student teaching experience. This investigation was a secondary analysis of data from 462 of these assessment documents. The FSTSR is divided into five sections, each section being associated with five general teacher competencies that are required by Section 17 of the State Administrative Rules (Oregon State Archives, 2010). The five general areas are, 1) Plan for Instruction, 2) Establish Classroom Climate, 3) Standards Based Teaching, 4) Assessment, and 5) Professional Behavior. A unifying heading prefaces the assessment items in each of these five sections. The numbered heading provides the first part of each statement, and the lettered item below finishes with the second part of each statement.

While each of the ratings from all five sections of the FSTSR were used in this study, a preliminary external analysis of item constructs indicated that several of the items on the instrument (items 1a through 1g, and item 2b) are a measure of student teacher proficiency that includes indications of developmentally informed practice; thus, these items form a group of measures that are distinctively related to student development. The majority of these items are in section one. This is because the heading of section one states: "Candidates plan instruction that supports student progress in learning and is appropriate for the developmental level & demonstrate they're able to…." This heading, which includes indications of a developmental appropriate practice, provides the beginning of each of the lettered items that follow. Thus, item 1a, when combined with the heading states:

Candidates plan instruction that supports student progress in learning and is appropriate for

> the developmental level and demonstrate they are able to: select or write learning goals for units of instruction that are consistent with the schools long term curriculum goals, state and district standards, research findings on how students learn, and the physical and mental maturity of one's students. (see Appendix A)

When combined with it's heading, this item clearly asks evaluators to consider how candidates have used their knowledge of development for appropriate instructional planning. All of the items in section one are similarly associated with development.

An additional item on the FSTSR is also specifically related to student development. Item 2b, when combined with its heading, reads,

> Candidates establish a classroom climate conducive to learning & demonstrate they're able to establish, communicate, and maintain rules, procedures and behavioral expectations that provide a safe and orderly environment for learning, are appropriate to the level of development of students, and are consistent with laws governing student rights and responsibilities.

This item asks evaluators to consider if classroom management is developmentally informed. Therefore, it was also included as a member of this distinctive group of items that include indications of a developmentally informed practice. In this investigation, the scores on these distinctive items, item 1a through 1g, and item 2b, were the independent or predictor variables.

The FSTSR is a measure of student teaching competency completed by university supervisors and cooperating teachers. The instrument itself does not include an overall summary score. For the purpose of this study, a simple summary score indicating overall student teacher proficiency was created for each unit of study. The student teacher proficiency index (STPI) is a simple sum of the 39 ratings (0 to 6) completed on each FSTSR, by both the university supervisor

and the cooperating teacher (CT). If a student, for example, were to receive a six on each of the 39 items, from both evaluators, they would have the maximum STPI of 468. The STPI scores were the dependent, or criterion variables in this study.

Statement of the Problem

The purpose of this study was to explore student teaching data on pre-service teachers from one private northwest university. This study was a secondary analysis on ratings of the proficiency demonstrated by the population of 462 candidates who completed their student teaching experience between the spring of 2005 and the fall of 2008. For each of these candidates, their cooperating teacher and a university supervisor recorded scores on the knowledge, skills, and competencies required for earning an Initial Teaching License, on a Full-Time Student Teaching Summary Report (FSTSR). The focus of this study was an exploration of how items on the FSTSR that includes the assessment of practice that is developmentally informed, may or may not predict a global measure of student teacher proficiency. The data was analyzed using parametric statistical procedures. The objective of this research was to gain data based insight into how the proficiency of teacher candidates' application of knowledge of child development to teaching and learning may be related to the overall success of their full-time student teaching experience.

Research Question

The following research question was asked about the proficiency ratings of student teachers from one private northwest university: How accurately can a measure of overall student teacher proficiency be predicted from a combination of measures of student teacher performance that include indications of a developmentally informed practice?

Definition of Terms

The following terms have been defined consistent with both the way that they are used in

this document and, as appropriate, with the usage typically used by candidates and teacher education faculty at the northwest university where data was explored.

Administrative Rules. These are the standards and regulations governing the licensure of teachers, specialists, and administrators in the state. They also govern the functioning of all Teacher Education Programs in the state (Oregon State Archives, 2010; School of Education, 2007).

Authorization level. The authorization level is the grades in which a candidate will be licensed to teach. Candidates typically are preparing to teach in two of four authorization levels: Early Childhood (grades pre-K to 4), Elementary (grades 3 to 8, self-contained), Middle Level (grades 5 to 9 with subject matter endorsement), or High School (grades 9 to 12 with subject matter endorsement) (Oregon State Archives, 2010; School of Education, 2007, 2009).

Cooperating Teacher. An experienced and qualified teacher who has agreed to guide, critique, supervise, and assess the student teaching activities of a student from the university during their designated student teaching semester. State Administrative Rules, chapter 584, division 17, rule 0070, states that the cooperating teacher should have had two years experience in early childhood, or elementary, or middle or high school immediately prior to supervision and hold a valid license for current assignments (Oregon State Archives, 2010; School of Education, 2007).

Developmentally Appropriate Practice (DAP). The National Association for the Education of Young Children (NAEYC) has defined developmentally appropriate practice as:

> The outcome of a process of teacher decision making that draws on at least three critical, interrelated bodies of knowledge: (1) what teachers know about how children develop and learn; (2) what teachers know about the individual children in their group; and (3) knowledge of the social and cultural context in which those children live and learn.

(Bredekamp & Copple, 1997, p. vii)

Bergin & Bergin define DAP from the NAEYC perspective. They state that developmentally appropriate practice "is an approach to educating children from birth to age 8 that emphasizes the child as an active participant in learning… (2010, p. 109)." In much of the research literature, the phrase similarly tends to refer specifically to those early childhood practices that are recommended by NAEYC. The NAEYC definition will be used here when discussing DAP from the NAEYC perspective.

Elsewhere in this document (typically in discussions of more recent research literature), when not discussing the NAEYC position, "developmentally appropriate practice" is a more general reference to the application of knowledge of human development to teaching and learning across age groups. Similarly, Meece & Daniels define DAP as "a phrase used to describe teaching strategies, curricula, discipline practices, learning approaches, classroom environments, and interpersonal relationships that promote children's development at all ages" (2008, p. G5).

Developmental Domains. These are distinct, but interconnected, areas of human development, including, but not limited to, physical, cognitive, social, and emotional components of growth, which are frequently referred to in the research literature related to this proposed study (Brody, Dorsey, Forehand, & Armistead, 2002; Burchinal, Howes, Pianta, Bryant, Early, et al., 2008; Hamre & Pianta, 2001, 2005; Mashburn, Pianta, Hamre, Downer, Barbarin, et al., 2008; National Institute of Child Health and Human Development Early Child Care Research Network, 2005a; Pianta, Belsky, Vandergrift, Houts, & Morrison, 2008).

Developmentally Informed Practice. This is teaching that closes the gap between developmental theory and practice. In this study, teachers that use a *developmental perspective* (see below) to inform their teaching decisions are often referred to as being engaged in developmentally

informed practice. This is similar to *developmentally appropriate practice*, when that phrase is not limited to the teaching of young children.

Developmental Perspective. A point of view that includes the ideas that: 1) developmental domains interact with, and impact, each other; 2) attention to the various developmental domains is important to the support of academic development of all children, and 3) a belief that specific classroom processes can facilitate children's development.

Full-Time Student Teaching Summary Report (FSTSR): A measure used by cooperating teachers and university supervisors to record proficiency ratings on the knowledge, skills, and competencies required for earning an Initial Teaching License.

Evaluation. The process of determining the competencies of a teacher education student at a given time in comparison to identified standards of performance. Formative and summative varieties of evaluation are used in the teacher education process (School of Education, 2007).

Master of Arts in Teaching Program (MAT). The total preparation for teaching, of candidates who already have an undergraduate content degree, for teaching in two of four authorization areas (School of Education, 2009).

MAT Formats. Three distinct MAT program approaches (Full-Time, Night, and Community), each with a different schedule for coursework and student teaching placements, but having the same expectations and responsibilities (School of Education, 2009).

Multicollinearity. A problematic condition when two or more predictor variables are very highly correlated in a multiple regression (Cohen, Cohen, West, & Aiken, 2003; Kachigan, 1991).

Proficiency Ratings. Scores on the knowledge skills, and competencies required for earning an Initial Teaching License that are determined by cooperating teachers and university supervisors and recorded on the *Full-Time Student Teaching Summary Report* (FSTSR).

School of Education Delivery Method. The particular arrangement of courses and curriculum that candidates participate in to grow as emergent teachers and to move toward eligibility for a teaching license, including the undergraduate program and the various MAT formats.

Student Achievement. In the proposed study, student achievement will refer specifically to the growth students may be able to demonstrate through assessment at the end of a unit of study when compared to a parallel assessment made at or near the beginning of the unit of study. This definition, while specific and simple, is sufficient for the discussion of the student teaching experience that will be discussed here.

Student Teacher. A student enrolled in the Teacher Education program that has successfully completed prerequisite courses and is qualified to be in a school classroom. The student teacher is to demonstrate proficiency in managing the classroom and in directing the learning activities of a group of students (School of Education, 2007).

Student Teacher Proficiency. The candidate's level of knowledge, skill, and competency as it has been assessed on the FSTSR. When a candidate is generally assessed at a level of three or higher (zero to six point scale) on measures of knowledge, skill, and competency on the FSTSR, he or she is considered eligible to apply for an Initial Teaching License.

Student Teacher Proficiency Index (STPI). A global score of Student Teacher Proficiency, created for this study, which is the sum of all of the 39 measures of knowledge, skill, and competency on the FSTSR, by both the university supervisor and the cooperating teacher. The maximum sum of the 78 scores (zero to six) is 468.

Student Teaching. Assigned supervised teaching placement that includes practice in subject content, cooperative supervision of classroom students, cooperative responsibility for

curricular or extra-curricular programs, and associated ongoing conferences and evaluations of student teacher competence (School of Education, 2007).

Teacher Effectiveness. While this complex term is open to wide interpretation, the Five-Point Definition of Teacher Effectiveness, as presented by Goe, Bell, and Little, is a way of thinking about teacher effectiveness that includes many of the current concepts that are frequently observed in the current research literature:

> • Effective teachers have high expectations for all students and help students learn, as measured by value-added or other test-based growth measures, or by alternative measures.
>
> • Effective teachers contribute to positive academic, attitudinal, and social outcomes for students such as regular attendance, on-time promotion to the next grade, on-time graduation, self-efficacy, and cooperative behavior.
>
> • Effective teachers use diverse resources to plan and structure engaging learning opportunities; monitor student progress formatively, adapting instruction as needed; and evaluate learning using multiple sources of evidence.
>
> • Effective teachers contribute to the development of classrooms and schools that value diversity and civic-mindedness.
>
> • Effective teachers collaborate with other teachers, administrators, parents, and education professionals to ensure student success, particularly the success of students with special needs and those at high risk for failure." (2008, p. 8)

This definition has been selected because it is broad, but precise, and because it was developed through a comprehensive look at the research literature on teacher effectiveness. In addition, this definition, in many ways, supports the developmental perspective that is discussed in the present review of the literature.

Undergraduate Teacher Education. The total preparation for teaching at the EC & EL Authorization level in a self-contained classroom, or in the EC through HS level in a music classroom (School of Education, 2007).

University Supervisor. This is the university faculty member who assumes the responsibility of mentoring, and evaluating one or more student teachers. This person is the liaison between the public school and the School of Education and consults with the cooperating teacher and student teacher in all matters related to the student teaching experience. State Administrative Rules, chapter 584, division 17, rule 0060 states that the university supervisor should have "in-depth academic preparation and experience in their instructional field", knowledge of schools, be regularly trained for the position and is knowledgeable of current state and program standards. Supervisors also have recent related experience (within three years), hold or are eligible to hold a state teaching license appropriate to the authorization level being supervised, and have had a minimum of three years' teaching in early childhood, or elementary, or middle or high school (Oregon State Archives, 2010; School of Education, 2007).

Dissertation Structure

Chapter One describes how a national emphasis on the application of knowledge of human development in the classroom has led to this research proposal: A local response to a national concern. The chapter emphasizes recent findings that teacher preparation programs in the United States are largely failing to help emergent teachers successfully apply their knowledge of child and adolescent development in their classrooms. Chapter one also introduces the Full-Time Student Teaching Summary Report, and indicates those distinct items on the report that include indicators of a developmental perspective. After defining many of the terms used in this proposal, the chapter concludes with a general statement of the aims of the research proposal, and concludes by

providing a broad overview of the structure of the dissertation.

Chapter Two begins by providing a theoretical framework for the proposed study. The literature review continues by discussing research that includes the investigation of in-service and pre-service teachers who have made connections between their knowledge of human development and their decisions and activities in the classroom. There is a general movement in the literature review from concepts of developmentally appropriate practice in early childhood learning environments to a broader conception of applied development to benefit learners of all ages. Chapter Two concludes by highlighting the current national call for an intentional effort by teacher preparation programs to help candidates learn to apply their knowledge of development to teaching and learning.

Chapter Three is a description of this investigation into how a combination of measures of student teacher performance that include indications of developmentally informed practice, may or may not predict a measure of overall student teacher proficiency. A brief history of the development of the Full-Time Student Teaching Summary Report is presented, along with the method and statistical design utilized in the investigation of items on the report. Reasons for the selection of this population are detailed, and procedures for the collection of data are described.

Chapter Four includes the results of the data analysis as it is related to the research question. Chapter Five presents an analysis and discussion of the results as well as limitations of the study and suggestions for future research.

Chapter Two: Literature Review

Teaching and learning from a developmental perspective has a rich theoretical history. This study includes, therefore, both a theoretical framework and a review of the research literature.

Theoretical Framework

Contemporary experts support the application of knowledge of human development to educational practice (Comer & Maholmes, 1999; Darling-Hammond & Bransford, 2005; Eunice Kennedy Shriver National Institute of Child Health and Human Development & National Council for the Accreditation of Teacher Education, 2007; National Board for Professional Teaching Standards, 2010). This is likely the result of a body of developmental theory that supports the proposal that teachers use knowledge of human development to support student learning. Cobb (1994) contends that, while such theories often conflict, many share a perspective of the student as an "active" learner (p. 14) and that these theories can "complement" each other in their support of more effective classrooms (p. 17).

While human development stands on its own, as a major area in the field of psychology, some theories of development have been clearly connected to teaching and learning by the theorists who conceived them. Gardner's theory of multiple intelligences is one example. Gardner (1993) believes that we have "different cognitive strengths and contrasting cognitive styles" (p. 6) and that acceptance of this theory would likely lead to different educational practices. He associates schools with core curriculum, paper/pencil tests, and class rankings, to a fixed theory of intelligence, where everyone's cognitive abilities are measured on a common scale. Gardner asserts that schools that embrace a theory of multiple intelligences would be about helping individual students find success in content and vocational goals that were directly connected to their cognitive strengths. This example of a developmental theory leading to a more student centered approach to

learning, one in which instruction is unmistakably informed by knowledge of the learner, will be reflected in the theories that follow.

One of the most influential theories that can lead to student centered learning is that of constructivism. The contributions of Dewey (1938) and Piaget (1952) were foundational to the later development of constructivist, child-centered learning theory, and many of their major ideas about teaching are similar. They believed that the learner built knowledge by actively engaging in the world around them. Dewey, therefore, emphasized the importance of the teacher's ability to engage the student in the subject matter. Among the important applications for teachers is that guiding student learning requires good knowledge of both the student and the content. Dewey and Piaget believed that new knowledge and skill was built upon previous knowledge and skill. By having an accurate developmental picture of the student, teachers can guide the learner in the appropriate next steps. In their influential book on developmentally appropriate practice, Copple and Bredekamp (2009) emphasize the importance of knowing the student, both as an individual, with distinct cultures, interests, knowledge, and abilities, and as a member of the human family, with general developmental characteristics that are comparable to others. One of Piaget's most recognized contributions has been to suggest stages through which children typically progress as they are constructing their knowledge (Kamii & Ewing, 1996; Openshaw & Stendler, 1965). In a classroom of diverse learners, supporting students as they construct their next steps of knowledge necessitates a very clear understanding of the framework of both the subject matter and of the experience of the learner.

Erikson (Meece & Daniels, 2008) and Bronfenbrenner (2005) are developmental theorist who help educators to understand the experience of the learner in dissimilar ways. Erickson, who has a stage theory similar to Piaget's, but extends the stages throughout ones lifespan, provides a

description of how phases of life, such as adolescents, may impact the learner. Bronfenbrenner's bioecological perspective, on the other hand, explains how the unique and broad environment within which each learner dwells, is inseparable from the learners identity. In order to make decisions that are in the best interests of the developing student, the teacher may benefit from an understanding of both Erikson's inner depiction of the student, and the outward ecological influences on the student that were developed by Bronfenbrenner.

It is important to note that Bronfenbrenner did not intend that the bioecology of the individual student be used simply as a way of providing teachers with knowledge of the learner. He, rather, envisioned a society that was increasingly aware that "human beings create the environments that shape the course of human development" (2005, p. xxvii). He also believed that society was headed in the wrong direction. He notes evidence of a "growing chaos" in the lives of children, youth, families, and schools and that there were likely to be developmental consequences if society continued in this vein (2001, pp. 13-14). In considering the social learning theory of Bronfenbrenner, we have moved away from Piaget's concept of construction of meaning as an individualistic activity. Piaget tends to emphasize the individuals ability to learn in isolation. For example, after recording that he had placed a chain attached to a rattle in a child hand, Piaget quickly dismisses his role in the activity, stating that he did so "only to start the experiment as this act of prehension would in any case be produced, sooner or later and fortuitously" (1952, p. 162). While Piaget emphasizes what learners can do on their own, Bronfenbrenner emphasizes the impact that others may have on the student.

We are, thus, introduced to social constructivism and the theories of Vygotsky and Bruner. With constructivist ideas and concepts about the importance of experience that are similar to those of Piaget and Dewey, the social constructivists have developed the collaborative aspects of

learning. In 1934, Vygotsky wrote, "What a child can do in cooperation today, he can do alone tomorrow" (p. 188). He proceeds to share, in nearly poetic terms, his concept of the zone of proximal development.

> Therefore the only good kind of instruction is that which marches ahead of development and leads it; it must be aimed not so much at the ripe as at the ripening functions. It remains necessary to determine the lowest threshold at which instruction in, say, arithmetic may begin, since a minimal ripeness of functions is required. But we must consider the upper threshold as well; instruction must be oriented toward the future, not the past. (1934, pp. 188-189)

When social constructivism is applied to education, teachers identify the lower "threshold" of a concept or skill in a learner, and guide the learner to a more mature understanding or ability. Bruner (1996) describes the activity of the teacher in helping the apprentice to construct new knowledge as building a temporary "scaffold" which provides support for the learner in a social context. "As a teacher," he says, "you do not wait for readiness to happen; you foster or 'scaffold' it by deepening the child's powers at the stage where you find him or her now" (1996, p. 120). Bruner joins the developmental psychologists above in making a strong case for including theories of human development in the teacher's instructional toolbox.

It is, therefore, not surprising that from William James in 1899 (Daniels & Shumow, 2003), to Shulman's influential work on teacher knowledge (1987), to a recent national gathering of experts in teacher education and human development (Garnett, 2008), an understanding of child and adolescent development has long been considered an important part of the body of knowledge that should be possessed by a teacher.

This concludes our look at theories that supports the belief that knowledge of human

development should be applied to teaching. Seeking to apply those theories to the classroom is no small task. According to Jerome Brunner,

> "Thoughtful people have been forever troubled by the enigma of applying theoretical knowledge to practical problems. Applying psychological theory to educational practice is no exception to the rule, not much less puzzling than applying science to medicine" (1996, p. 44).

The next section is an examination of the research literature to see what evidence there may be that pre-service and in-service teachers are applying their theoretical knowledge of development to the practice of teaching and what investigations there may be into how practices that are associated with a developmental perspective may relate to overall teacher effectiveness or student learning.

Review of the Research Literature

The present study was both motivated by, and built upon, an attentive review of the literature. A careful analysis and synthesis of research related to the use of knowledge of human development by teachers in the classroom is intended to provide a solid foundation for this study. By building on the existing research literature that examines applied knowledge of human development by classroom teachers, a depiction of current understanding is presented along with indications of how this study may extend that understanding.

Context. Experts in teacher education and experts in human development have been considering how their fields might inform each other on behalf of children. There is currently an ongoing collaborative effort between the National Institute of Health and Human Development (NICHD) and the National Council for the Accreditation of Teacher Education (NCATE) (Pianta, et al., 2010). One of the conclusions of this gathering of specialists in teacher education and child and adolescent development is that, while a course in human development is often required, most

teacher education programs are not presenting the content in ways that clearly help candidates connect their knowledge of child and adolescent development with the classroom. While it seems to be largely accepted that knowledge of human development is an important aspect of teaching (National Council for the Accreditation of Teacher Education, 2008; Pianta, et al., 2010; Rochkind, Ott, Immerwahr, Doble, & Johnson, 2008), there may not be adequate instruction or understanding about how this knowledge might actually shape the practice of teaching. These conversations around the application of child development knowledge to teaching and learning are one aspect of a broader contemporary dialogue about ways to shrink the gap between teacher education and practice in the classroom (Cibulka, 2010; Eunice Kennedy Shriver National Institute of Child Health and Human Development & National Council for the Accreditation of Teacher Education, 2007; Pianta, et al., 2010). It has been reports and findings from this national collaboration of policy makers, as well as a personal and professional interest in how knowledge of child development impacts teacher practice, that has motivated this researcher's interest in seeking data based insight into the proficiency of teacher candidates' application of knowledge of child development to teaching and learning.

Inclusion. This study begins by seeking research literature on in-service and pre-service teachers who have made connections between their knowledge of human development and their decisions and activities in the classroom. Reports were sought of research efforts to describe, or measure, the application of understanding about child and adolescent development by teachers, and comparisons that have been made? In addition to data on individual teachers, have teacher education programs been identified that emphasized the connection between knowledge of human development and classroom practice, teacher effectiveness, or student learning. These are the concepts that guided this investigation into the research literature.

In this literature review, therefore, studies have been included if they examine the classroom application of knowledge of human development by in-service or pre-service teachers. Studies were also included if they investigated proficiency or assessment of teacher candidates' application of knowledge of child development to teaching and learning in teacher preparation programs. Aside from looking at teacher education programs, studies that do not clearly address teachers using their knowledge of human development in ways that impact their teaching in the classroom have been excluded. The strengths and weaknesses of these studies is considered, as well as how they may, individually and collectively, inform the research that is being proposed. This literature review will conclude with how the proposed research may extend our understanding in this specific area of current interest in teacher education.

An overview. Much of the research literature on teaching and learning from a developmental perspective is related to approaches to early childhood education. This review of the literature will begin by looking at early childhood studies on approaches to the education of young children. Included will be a thorough look at studies, between 1986 and 2005, related to the National Association for the Education of Young Children (NAEYC) position statement on early childhood education, and how the findings from these studies have impacted the position statement over time. After looking at new perspectives of developmentally appropriate practice that have arisen over the past decade, this review will look carefully at more recent studies that have been made by researchers who hold to a developmental perspective. This will include specific developmentally appropriate classroom processes that are supported by this recent literature. This review will conclude with a brief look at one study that has investigated aspects of child and adolescent development in teacher education.

A continuum of early childhood approaches. A great deal of the attention given to the

intersection of our understanding of human development and our understanding of the education of children is found in the work of those whose primary focus is the care and education of young children. Two primary groups with this focus are early childhood educators and child development specialists. From the perspective of some investigators, early childhood instructional strategies advocated by educators and learning theorists have been distinct from those approaches typically advocated by child development experts (Stipek, Daniels, Galluzzo, & Milburn, 1992; Stipek, Feiler, Daniels, & Milburn, 1995). Educators were associated with "the early introduction of basic skills using teacher-directed, didactic instructional approaches" while child development experts were linked to a constructivist perspective, advocating "a child-centered approach that emphasizes child-initiated learning activities" (Stipek, et al., 1992, p. 2). Investigators have also recognized that educators and child development specialists have never clearly fallen into a particular instructional camp. There are child development specialists, for example, who believe that didactic instructional approaches have "significantly improved the achievement of poor, minority children" (Stipek, et al., 1995, p. 202). Many educators have strongly advocated for a more child-centered approach, as will be seen below.

In time, these instructional approaches were placed as ends of a continuum of educator practices and beliefs. Buchanan, Burts, Bidner, White, and Charlesworth (1998) associated the teacher-directed end of this continuum of educational practices with behaviorist theory, repetition, breaking tasks into small sequential steps, external reinforcement, and direct instruction. They aligned the child-initiated end of the continuum with cognitive developmental theory, constructivism, exploration, physical and social experience, and culturally transmitted knowledge. The perspective of these researchers was that "individual teachers occupy different positions along the continuum of teaching practice" (p. 460).

The NAEYC position. In 1986, however, one early childhood organization took a firm position on one end of this continuum. The earliest studies in this review tend to build upon an influential National Association for the Education of Young Children (NAEYC) document (Bredekamp, 1986) which drew heavily from the developmental theories of Piaget and Montessori and was believed to represent the expertise of many leading early childhood experts (Burts, Hart, Charlesworth, & Kirk, 1990). Jones and Gullo (1999) described this document, titled *Developmentally appropriate practice in early childhood programs: Serving children from birth through age 8*, as having had "a major impact on the field of early childhood education", and that the guidelines in the document "represent the consensus of opinion on the status of current knowledge and thinking in the field" (p. 26). This publication, which was recently released in it's third edition (Copple & Bredekamp, 2009), makes clear the commitment of many in the early childhood education community to pursue the constructivist perspective and advocates for a more child-centered, less didactic approach to early childhood education. Stipek and Byler (1997) summarized the "child-centered" aspects of the NAEYC position in this way:

> They recommend that teachers serve primarily as resources to children's self-initiated activities, providing open-ended opportunities for children to explore concrete materials and to interact with each other. Basic- skills teaching using drill and practice, workbooks, and worksheets is discouraged; instead basic skills are supposed to be embedded in everyday, meaningful activities. We refer henceforth to this constellation of practices as "child-centered." (p. 306)

Methods of teaching basic skills have consistently been a key point in the discussion about what constitutes developmentally appropriate practice. NAEYC did not speak for all early childhood educators. Bredekamp's 1986 document was released in the midst of a strong and sustained

movement in early childhood settings to create an increasingly academic approach to early childhood education (Burts, Hart, Charlesworth, Fleege, Mosley, et al., 1992; Charlesworth, Hart, Burts, & Thomasson, 1993; Hitz & Wright, 1988; Hyson, Hirsh-Pasek, & Rescoria, 1990; Schweinhart, 1988; Stipek, et al., 1995). While Charlesworth (1998b) encouraged educators to avoid viewing all academics as being in opposition to developmentally appropriate practice, Copple and Bredekamp (2008) continue to identify a "Narrow focus (for example, only on literacy and math instruction)" as developmentally inappropriate practice (DIP) (p. 54). They believe that an emphasis on an academic approach in early childhood settings may sometimes be accompanied by classroom characteristics that are in conflict with DAP principles.

At the time of the 1986 release of the NAEYC position statement, early childhood educator convictions toward either the child-centered or teacher-directed ends of the continuum were largely based in theory and expert beliefs. Several researchers recognized a need and an opportunity to seek empirical data, which might build support for a particular conviction.

Research prompted by the NAEYC position. In releasing the 1984 Bredekamp document, NAEYC provided a structure that was well supported by the early childhood community. While not all investigators were in favor of the NAEYC guidelines (Lubeck, 1998), it, nevertheless, quickly became a preferred foundational work for many researchers who agreed with its constructivist conclusions (Charlesworth, 1998a). Several researchers who concurred with NAEYC's constructivist position recognized an urgent need to add empirical support to Bredekamp's theoretically based framework for developmentally appropriate practice (Bryant, Clifford, & Peisner, 1991; Burts, et al., 1990; Charlesworth, et al., 1993; Hitz & Wright, 1988).

Some of these investigators sought to support convictions that didactic approaches, those on the opposite end of the continuum from DAP approaches, could have negative consequences for

children. Stipek et al. (1995) summarized the concerns about didactic instruction in this way:

> Didactic instruction is presumed by many experts to inhibit intellectual development directly—by fostering superficial learning of simple responses rather than real understanding and problem solving ability—and indirectly, by negatively affecting social-motivational variables which, in turn, affect learning-related behavior (e.g., effort, persistence). (p. 209)

In an investigation of a possible negative impact of didactic instruction, Burts et al. (1990), studied the frequency of stress behaviors seen in 37 kindergarten children, 17 of which were in classrooms considered to be developmentally inappropriate. While these investigators report significantly more stress behaviors in children in developmentally inappropriate classrooms, they note that they were surprised to find that some activities in the developmentally appropriate classrooms (center time and transition activities) resulted in more stress behaviors exhibited in children than the same activities in the developmentally inappropriate classrooms. Nevertheless, they report that their findings were "a first step in providing empirical data to support the position of (those) who have warned of the negative consequences of inappropriate practices" (p. 417).

Other researchers used the NAEYC position statement as a standard upon which to build instruments to use in determining if early childhood classrooms and educator beliefs were consistent with the NAEYC recommendations (Bryant, et al., 1991; Hitz & Wright, 1988; Hyson, et al., 1990). Hitz and Wright (1988) questioned Oregon principals of schools with kindergarten programs, and 315 randomly selected Oregon grade one teachers about their views on instruction in kindergarten. Six questions reflected a formal academic approach; with more seat work, less student choice and play, more structure, and extrinsic rewards. Six other questions reflected a developmental approach with more student choice and play, less structure, and a focus on intrinsic

rewards. They found that " though there is substantial agreement on what should not be done, commitment to the alternative developmental philosophy is incomplete" (p. 30). There was not a clear commitment from Oregon principals to substantial times of kindergarten play, and less than half of the principals and teachers expressed a commitment to child-chosen activities or to limiting tangible rewards. Both Hitz and Wright were serving on the NAEYC board when this research was published. Their 1988 study and Burts et al. 1990 study is research that adopted the language of the NAEYC in referring to the child-centered ends of the continuum of instructional approaches as a developmental or developmentally appropriate approach. It is likely that these researchers, like several of their contemporaries, were partial to the NAEYC position, and recognized a need to provide empirical support for the perspective.

The impact of the 1986 position statement is so prevalent in the research on child-centered practice in early childhood education, over the next few years, that it seems strange when it is missing. A similar study of 178 kindergarten teachers and 58 principals from Texas also found that teachers of young children were more often opposed to a strong emphasis on academics in early childhood education, and supportive of child-centered practices, and that principals and their teachers were not always in full agreement on these matters (Spidell-Rusher, McGrevin, & Lambiotte, 1992). Interestingly, these investigators in Texas, who claimed that their questionnaire "was developed through a comprehensive review of the literature on early childhood education" (p. 282), was the only early childhood study that was identified from the late 80s and early 90s that both examined educator beliefs about child-centered practice, and failed to reference the NAEYC position statement from 1986/1987.

Bryant et al. (1991) created an observational measure, based on the NAEYC position statement, which they called the Checklist of Kindergarten Activities. Using this new tool, in

conjunction with the Harms and Clifford (1980) Early Childhood Environment Rating Scale (revised for kindergarten), they investigated North Carolina kindergarten classrooms for developmental appropriateness. They found that only 20% of the 103 classrooms in their study met or exceeded their criteria for developmentally appropriate.

Stipek et al. (1992) is the earliest study identified which attempts to empirically characterize programs on a didactic vs. child-centered scale. Using the Hyson et al. (1990) inventory, which is based upon the NAEYC position statement (Bredekamp, 1986), and the Harms and Clifford (1980) Early Childhood Environment Rating Scale, as well as a teacher belief survey, the investigators divided 62 preschool and kindergarten programs into three categories, including didactic programs (stressed basic skills), child-centered programs (stressed positive social context) and intermediate programs (stressed both basic skills and positive social context). In this study, teachers' beliefs about appropriate education for young children were found to be associated with the category of program in which they taught. The type of program, however, did not associate with the teachers' levels of education and experience or school policies regarding formal evaluation, retention, and testing.

The NAEYC position statement, as originally set forth in the 1986 Bredekamp document, first revised and republished in 1987, sparked a body of educational research on developmentally appropriate practice (DAP) that would continue into the new millennium. These researchers would find, however, that support for educational practices typically assigned to the DAP end of the continuum tended to be consistently accompanied by support for some practices that had been considered to be developmentally inappropriate, such as teacher directed instruction or an emphasis on basic skills. In time, this would begin to shape educator understandings of what was considered developmentally appropriate practice.

Extended, but mixed, findings on DAP. Most of the studies reported in this review seem to be implemented by supporters of a more constructivist educational practice. What develops over the course of almost a decade, therefore, is what appears to be concerted effort to build a case for developmentally appropriate instruction from the perspective of the child development community. It begins with the 1986 NAEYC position statement motivating the development of empirical tools. This led to examinations of educator beliefs about early childhood instruction and, also, to the characterization of early childhood programs as more didactic or more child-centered. Stipek et al.'s (1995) research article on the effects of different instructional approaches on young children's achievement and motivation is an effort to demonstrate empirical connections between more didactic or more child-centered classrooms, and student outcomes. The researchers recognized a need for taking the research to this next step. While they believed that studies have tended to favor a child-centered approach in early childhood classrooms, they state that "extant evidence is not sufficient or constant enough to confidently proclaim the superiority of either approach for achievement outcomes" (1995, p. 210).

Stipek et al.'s 1995 study, of 227 diverse preschool and kindergarten children from 18 didactic and 14 child-centered classrooms, found that early childhood programs that stressed basic skills in reading (didactic) had students who had significantly higher scores on a letters/reading achievement test. Students in the didactic programs, however, did not score higher on a numbers achievement test than those in the classrooms that did not place as much emphasis on basic skills (child-centered). These investigators also found that, for both economically disadvantaged and middle-class children, didactic classrooms led to an increase in negative outcomes on measures related to student motivation, including lower self-rating of abilities and lower expectation of success in academics, more dependency on adults for permission and approval, less pride in

accomplishments, and more worry about school (Stipek, et al., 1995).

In 1997, Stipek and Byler were prepared to state that the NAEYC position statement is "generally supported by research on the effects of instructional approaches on children's learning and motivation"; quickly adding, however, that some of the research has been supportive of practices that place "a greater emphasis on basic skills using direct, highly structured teaching approaches"(p. 306). This study found that beliefs, goals, and practices of preschool and kindergarten teachers tended to cohesively relate to either a "more basic skills" oriented, or a "more child-centered" oriented model. The study also indicates that this may be less true for teachers of first grade. While the researchers were cautious because of the small sample of first grade teachers (n=16), they report that "results consistently suggest that first-grade teachers may not see child-centered and basic-skills oriented practices as clearly distinct and incompatible approaches" (Stipek & Byler, 1997, p. 320).

Just as Stipek, et al. felt it was important to extend research on DAP from the NACEY perspective to first grade education (1995), Buchanan et al. (1998) made a point to extend their research to third grade education, and thus fully acknowledging the NAEYC intent that their principles of developmentally appropriate practice apply through age eight (Copple & Bredekamp, 2009). These researchers modified The Primary Teachers' Beliefs and Practices Survey, used previously to measure how kindergarten teacher beliefs and practices aligned with the NAEYC position (Charlesworth, et al., 1993), so that it could be used to investigate "the prevalence of developmentally appropriate practice in the primary grades of one school district, and to determine what factors would predict primary teachers' agreement with the 1987 NAEYC standards in their beliefs or their practices" (Buchanan, et al., 1998, p. 461). Findings from this study supported the conceptual strength of identifying teacher beliefs and practices as either developmentally

appropriate, or developmentally inappropriate. This conclusion was helpful, as researchers sought to investigate these principles beyond pre-school and kindergarten to the third grade. Findings from this study also supported previous findings (Stipek, et al., 1995) that teachers of younger children were more likely to align their instruction with the NAEYC position that teachers of older children.

At the end of the decade, Jones & Gullo (1999) note that little progress had been made in empirically demonstrating the value of DAP in post kindergarten classrooms. In a review of the literature they acknowledged that while theoretical support for developmentally appropriate practice was abundant, there was still little research supporting its effectiveness. They write that there is "a lack of research to document the potential benefits of adopting developmentally appropriate practices at the primary grade level" (p.28). These investigators, therefore, did a study (Jones & Gullo, 1999) on 293 students and teachers in first grade classrooms from four public elementary schools in a large urban school district in the Mid-Western United States. They investigated the prevalence of DAP, the effects of developmentally appropriate beliefs and practices on achievement test scores in language and mathematics, and the impact of DAP on a teacher rating of student's social skills. They found that students scored higher on end of the year language arts measures (Response to Reading, Command of Language, and Management of Content) in the classrooms that were not considered developmentally appropriate and students in developmentally appropriate classrooms scored better on ratings of social competence skills. Math scores were not associated with either approach. These findings are reminiscent of earlier findings (Stipek, et al., 1995) of higher scores in letters/reading achievement among preschool and kindergarten students in more didactic programs.

Changes in what it means to be developmentally appropriate. The NAEYC guidelines for developmentally appropriate practice were modified in their 1987 publication, only a year after

the original Bredekamp document was published. Meaningful modifications were again evident in the 1997 edition (National Association for the Education of Young Children). These modifications reflect the evolution of beliefs by child development experts and early childhood educators, and findings from research. In the 1997 NAEYC modifications, the DAP guidelines were revised to clearly express the role of direct instruction in the early childhood classroom, and wording was carefully adjusted so that both teacher directed and child initiated teaching approaches were valued. The 1997 edition also included language about the importance of the role of the cultural and social context in which children live (Bredekamp & Copple, 1997; Buchanan, et al., 1998). The theories of constructivism, behaviorism, and socio-cultural theory were now all considered to contribute to developmentally appropriate practice (Buchanan, et al., 1998).

Researchers who were interested in the study of DAP as presented by NAEYC, however, did not always use tools that were current with the most recent NAEYC position. In the Jones and Gullo study (1999), the teachers from each first grade classroom filled out a self-report measure which was intended to assess the degree to which their beliefs and practices were consistent with DAP principles. The measure reportedly used was " a questionnaire designed to measure the nature of their instructional practices as well as their beliefs about developmentally appropriate practices" based on the 1990 study by Charlesworth, Hart, Burts, & Hernandez (Jones & Gullo, 1999, p. 30). Whether intentional, or unintentional, it appears that this questionnaire was not based on the most current thinking about developmentally appropriate practice at the time of the 1999 study. According to Burts et al. (1992), the 1990 Charlesworth, Hart, Burts & Hernandez measure was constructed using the 1986 NAEYC guidelines for developmentally appropriate practice for 4- and 5-year-olds. The 1990 questionnaire was later revised, removing some items based on the results of an earlier factor analysis and adding other items based on the updated 1987 edition of the NAEYC

guidelines (Burts, et al., 1992). This revised version of the Charlesworth et al. measure appears to be the one modified for first grade by Buchanan et al. (1998). As the Jones and Gullo study appear to have used a measure based on the original 1986 NAEYC document, it may be that their questionnaire did not reflect subsequent changes in the NAEYC position regarding developmentally appropriate practice. Perhaps the changes, over time, in the NAEYC position had some impact on Jones and Gullo's (1999) conclusions, from data collected using what may be an outdated measure, that first grade teachers "may in fact believe that certain practices reflect DAP teaching, when in fact they do not" (p. 33). It is easy to see how teachers in 1998 who were familiar with the new 1997 release of the NAEYC green book may not have completely aligned their beliefs with the NAEYC position of 1987.

Ambiguous support for NAEYC's DAP. The Jones and Gullo (1999) notation of a lack of consistent empirical support for educational advantages from NAEYC based developmentally appropriate practice continues to be a theme in the literature. Marcon (1999), for example, studied the impact of various preschool models on development, in part because "existing research is inconclusive in its support of a single best approach (p. 358). Huffman and Speer (2000), found in their review of the literature that, particularly in regard to academic outcomes, "little clarity about the relative strengths and weaknesses of these instructional approaches exists" (p. 171). Their conclusion that this, in part, may be due to differences in samples, led them to findings in support of DAP practices among kindergarten and first grade students in impoverished urban settings.

Updating previous measures, Maxwell, McWilliam, Hemmeter, Ault, and Schuster (2001) developed the Assessment Practices of Early Elementary Classrooms tool. This measure of developmentally appropriate practice in kindergarten through third grade classrooms was based

on the 1997 version of the Copple and Bredekamp document. Their study of 69 classrooms was used both to document the validity and reliability of the tool, and also to investigate variables that may account for variance in observed classroom practices. They found that about one fourth of the variance was from the grade level of the classroom. Kindergarten and first grade classrooms were much more likely to align with NAEYC's DAP principles than 3rd and 4th grade classrooms. They suggest that additional research is needed in order to understand what it is about grade level that impacts developmental practice. These investigators additionally found that a teacher's level of education and teacher beliefs also had an impact on developmental practice. Both teachers with a Masters Degree and teachers who reported beliefs consistent with DAP had more developmentally appropriate classrooms. Their investigation, like several others reported here, assumes that the developmentally appropriate standards as set forth by NAEYC are desirable. The study, therefore, does, not include efforts to empirically demonstrate positive outcomes of DAP.

This is in spite of the fact that ambiguous support of NAEYC's DAP continues. In a comprehensive study by Van Horn & Ramey (2003) of 4,764 primary age children, kindergarten to grade three, who had been in a head start program, the few small effects found in this study were mixed; some associated with higher student outcomes and others associated with lower outcomes. The researchers conclude that DAP cannot be associated with improvements in overall student performance on standardized tests of student achievement. Van Horn and Ramey also conclude that their research distances student achievement from some of the constructs that are commonly associated with DAP. One of these constructs is a social and emotional emphasis in the classroom.

Finally, a meta analysis by Van Horn (2005) which included many of the studies discussed above, found limited support for the positive educational impact of DAP, and was critical of the

data analysis in much of the previous research. Their findings that there is limited support in the literature for the NAEYC conception of DAP is consistent with the overall findings of research on developmentally appropriate practice over almost two decades.

A summary characterization of the NAEYC associated research between 1986 and 2003 includes some important issues to consider. First, several of the conclusions in favor of the NAEYC position should be viewed with an understanding that researchers were seeking to support the NAEYC conclusions. Next, there are studies that clearly show support for classroom approaches that were originally considered by NAEYC to be developmentally inappropriate. Also, some studies have challenged the notion that practices considered to be developmentally appropriate for preschool and kindergarten students are also considered appropriate for primary classrooms, and, finally, practices that are considered by educators and policy makers to be developmentally appropriate are evolving and tend to be a moving target. This has sometimes caused these studies of developmentally appropriate practice to be somewhat behind the times and outdated.

The more recent research on developmentally appropriate concepts in education rarely references this body of empirical work from the first decade following the 1986 Bredekamp document. One wonders if these issues have caused some to distance themselves from the NAEYC perspective. Perhaps, however, more recent studies are reflective of a broader conception of developmentally appropriate practice that is not confined to the education of young children.

Toward a broader conception of DAP. Not all of the attention given to a more constructivist, developmentally appropriate, and student-centered approach to instruction was based in the NAEYC perspective. Other studies investigated instructional decisions based on primary school children's understanding and on the development of more constructivist

instructional practices in mathematics (Fennema, Carpenter, Franke, Levi, Jacobs, et al., 1996; Simon, 1995; Simon & Schifter, 1991, 1993). As these researchers looked empirically at how knowledge of child development might impact primary instruction and primary student achievement, they did so from a content perspective. Fennema et al. (1996), for example, looked at the impact of a four-year teacher development program, called Cognitively Guided Instruction, on the beliefs and practices of 21 primary grade teachers. The major goal of this program was to help teachers to understand the development of children's thinking in mathematics so they might adjust their instruction appropriately. Their findings suggest that this is an effective form of teacher knowledge. This approach to developmentally appropriate instruction aligns with Shulman's (1986) concept of pedagogical content knowledge (PCK). Shulman proposed that PCK is a type of teacher knowledge which "includes an understanding of what makes the learning of specific topics easy or difficult: the conceptions and preconceptions that students of different ages and background bring with them to the learning of those most frequently taught topics and lessons" (p. 9).

Peterson, Fennema, Carpenter, and Loef (1989) studied 39 first grade teachers from 27 schools in and around Madison WI. They investigated relationships between teacher's pedagogical content knowledge and beliefs with student achievement in mathematics. Survey tools and interviews for this study were built, largely, around Shulman's (1986) construct of pedagogical content knowledge. Using survey results and ratings from interviewers, teachers were differentiated as falling into categories of cognitively-based, or less cognitively-based instructors. One aspect of the "cognitively-based" category was that teacher responses aligned more closely to Shulman's belief that teachers will be more effective if they know how students of "different ages and backgrounds" bring particular notions to content (Shulman, 1986, p. 9). Investigators found a

relationship between student growth in mathematics and the category of teacher. While they did not find a difference in student's computational skills, they did find that students who were in the classrooms of the "cognitively-based" teachers were better at mathematical problem solving. This conclusion illustrates a trend in these studies investigating the application of human development knowledge to teaching. While some aspects of student achievement (such as problem solving) seem to be related to developmentally informed instruction, the impact on other aspects of achievement (such as computational skills) has not yet been empirically demonstrated.

Maxwell et al. (2001), who developed the NAEYC position based assessment tool discussed above, recognized that some of these aspects of excellent instruction are not evaluated in their new measure of developmentally appropriate practices for primary classrooms. They encourage researchers and practitioners, who use their assessment tool, to supplement their study with assessment procedures such as those used by Fennema et al. (1996). While developmentally appropriate practice, as a phrase, will continue to be used by many in the early childhood community in specific reference to the NAEYC position statement and to early childhood education (Bergin & Bergin, 2010; Copple & Bredekamp, 2008), Maxwell et al.'s acknowledgment of this separate, but valued, strain of developmental application in education is a voice with those who think of developmentally appropriate education in more universal terms. They make their perspective clear:

> By marketing the concept of developmentally appropriate practice as one that applies *only* to young children, supporters of developmentally appropriate practice may inadvertently be doing more harm than good. People may dismiss the ideas as relevant only for very young children when, in fact, many of the principles apply to children and adults of all ages. (Maxwell, et al., 2001, p. 446)

A new DAP paradigm. There has been a shift of emphasis away from the research that builds upon NAEYC's early childhood principles of DAP (Bredekamp, 1986; Copple & Bredekamp, 2009) and toward a broader perspective of applying knowledge of development to teaching and learning across age groups. As a strong example of this shift, in their 2005 book on teacher preparation, Darling-Hammond and Bransford include a chapter called "Educating Teachers for Developmentally Appropriate Practice" (Horowitz, Darling-Hammond, Bransford, Comer, Rosebrock, et al., 2005). The content of this chapter is about preparing teachers across all grade levels, and is not rooted in the early childhood principles of NAEYC's DAP (Copple & Bredekamp, 2009). As if to be sure that readers understand the ubiquitous value of developmentally appropriate practice, they conclude their chapter by stating, "In both elementary and secondary classrooms, the more developmentally prepared teachers are, the higher the probability that each child will learn and grow successfully" (Horowitz, et al., 2005, p. 125). The chapter sets out a framework for developmentally preparing teachers that includes supporting candidate growth in knowledge of child and adolescent development, supporting growth as a keen observer of children, and supporting the candidate's ability to apply what they know about development and what they have observed in students to teaching choices and behaviors.

As another example of a more holistic perspective of developmentally appropriate practice, Armstrong, in *The Best Schools: How Human Development Research Should Inform Educational Practice* (2006), uses the terms "developmentally appropriate" and "developmentally inappropriate" as he makes the case that a consuming focus on academic achievement in national efforts to create quality schools has done damage to developmentally appropriate practice in K-12 schools. It is suggested that we should talk about developmental high school in much the same way that we commonly talk about developmental kindergarten. Armstrong's book is largely in response

to the perspective that teacher quality can be purely equated with student achievement outcomes (Hanushek & Rivkin, 2006). According to Cochran-Smith (2008), determining teacher quality using only student achievement is insufficient.

> This approach allows the sorting of teachers and students into segments from highest to lowest performing, but it does not tell us anything about what effective teachers do, know or believe, nor does it tell us anything about how high-performing pupils learn or what resources they bring to school. Further, other school outcomes – such as students' social and emotional development or their preparedness for civic participation in a democratic society – are ignored. (p. 273)

While Armstrong (2006) contrasts a human developmental discourse against an academic achievement discourse, Comer asserts that development and academic learning are inextricably linked (2005, p. 757).

The Comer perspective. For over forty years, the Yale Child Study Center School Development Program (SDP), under the leadership of James P. Comer, has influenced districts and schools to take a firm stand for the human development discourse. The SDP program has sought to make the healthy development of children the central focus of districts, schools, and classrooms, and in doing so, have reported multiple positive effects, including successfully closing the achievement gap between high and low risk students (Comer, 2005; Comer & Emmons, 2006; Comer & Haynes, 1999; Comer & Maholmes, 1999). In 2005, Comer reported that the Yale School Development Program had engaged in over 1000 schools over 35 years. While empirical studies have been done on the effectiveness of the SDP districts and schools (Borman, Hewes, Overman, & Brown, 2003; Comer & Emmons, 2006; Cook & Hirschfield, 2008), the design and practice of the Comer development schools appear to be largely based on developmental theory

and knowledge that comes from practice, rather than on empirical understandings. In one meta-analysis, the SDP was one of three out of 15 comprehensive school reform models that were found to have the most evidence of effectiveness (Borman, et al., 2003). A major emphasis of that effectiveness is that these models appear to continue to show promise at making progress in closing the achievement gap (Gorey, 2009). Though it appears to require significant resources, the SDP program is one option for districts and schools who may be interested in making a major shift toward the centrality of child and adolescent development in schooling (Yale School of Medicine Child Study Center, 2010).

Recent studies. Over the past decade, a meaningful body of work has emerged of studies that have sought to document specific classroom processes that may smooth the progress of children's development. Unlike most of the studies discussed earlier in this review, these recent studies, while they include research on early childhood classrooms, are largely unassociated with the NAEYC position, and include research on older elementary and adolescent classrooms. While these studies are predominantly descriptive and correlational, as a group they suggest the nature of a classroom that both takes into account the development of individual children and is supportive of children's healthy development. All of the studies that follow clearly take a developmental perspective to schooling and these studies all include data collection from the investigation of actual students and teachers in the classroom.

A developmental perspective. The reports of these studies reveal a perspective that strongly shapes this body of research. First of all, these researchers tend to take a holistic view of child and adolescent development, that is, they believe that the developmental domains (i.e. cognitive, social-emotional, behavioral, physical) interact and impact each other. They view academic progress as a developmental process (Pianta, et al., 2008) and, therefore, believe that attention to

the various developmental domains is important to the support of academic development (Brody, et al., 2002; Burchinal, et al., 2008; Hamre & Pianta, 2001, 2005; Mashburn, et al., 2008; National Institute of Child Health and Human Development Early Child Care Research Network, 2005a; Pianta, et al., 2008). They do not focus only on the academic goals of schooling, but they are interested in practices that demonstrate "a developmentally informed view of children and their developmental needs" (Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009, p. 970). They tend to be convicted that students will benefit from such classroom practices (Burchinal, et al., 2008; Hamre & Pianta, 2001, 2005; McDonald Connor, Piasta, Fishman, Glasney, Schatschneider, et al., 2009).

Moreover, these researchers believe that specific classroom processes can facilitate children's development (Brody, et al., 2002; Crosnoe, Johnson, & Elder Jr, 2004; Hamre & Pianta, 2001, 2005; National Institute of Child Health and Human Development Early Child Care Research Network, 2005a, 2005b; Pianta, et al., 2008). They are largely convicted that classrooms "hold potential to alter children's developmental trajectory" (Rimm-Kaufman, et al., 2009, p. 970). They view their research as a tool that will potentially improve how classrooms will influence development (Pianta, Belsky, Houts, Morrison, & The National Institute of Child Health and Human Services Early Child Care Research Network, 2007) and they promote the allocation of school resources toward those processes that promote development (Mashburn, et al., 2008; Pianta, et al., 2008).

As may be expected, instructional quality and classroom management are two of the classroom constructs that receive focus in this body of research. Another broad principle that is common in their developmental perspective is an emphasis on teacher-student interactions (Burchinal, et al., 2008; Mashburn, et al., 2008; O'Connor & McCartney, 2007; Pianta, et al., 2007;

Pianta, et al., 2008; Rimm-Kaufman, La Paro, Downer, & Pianta, 2005). Several of these studies also emphasize the importance of healthy teacher-student relationships (Crosnoe, et al., 2004; Hamre & Pianta, 2001; O'Connor & McCartney, 2007; Pianta, et al., 2008). By including a focus on teacher-student interactions and relationships, broad aspects of Instructional quality and emotional quality are associated in this body of literature. Pianta et al. (2007), for example, reports that investigation of the multi-year data collected by the National Institute of Child Health and Human Development (NICHD) Early Child Care Research Network (ECCRN) on more than 1000 American children (2005b), suggests that emotional and instructional support in the classroom predict growth in both academic and social functioning through fifth grade.

Specific classroom processes that support development. Investigators who take a developmental perspective have provided several reports of studies over the last decade that indicate that classroom processes may facilitate student development (Brody, et al., 2002; Burchinal, et al., 2008; Crosnoe, et al., 2004; Hamre & Pianta, 2005; McDonald Connor, et al., 2009; O'Connor & McCartney, 2007; Pianta, et al., 2007; Pianta, et al., 2008; Rimm-Kaufman, et al., 2009; Rimm-Kaufman, et al., 2005). These researchers have found that four related categories of classroom processes (instruction, management, teacher-child interactions, and teacher-child relationships) are related to positive outcomes for children.

Instructional quality. The studies indicate that quality instruction in the early childhood classroom is related to healthy student development (Burchinal, et al., 2008; Hamre & Pianta, 2005; McDonald Connor, et al., 2009; Rimm-Kaufman, et al., 2005). Hamre & Pianta (2005) found that students identified as at risk in kindergarten, who were in first grade classes that exhibited strong instructional and emotional support, had achievement scores proportionate to that of their low risk peers. In another study of early childhood classrooms, Burchinal et al. (2008)

found that the instructional quality of pre-kindergarten classrooms predicted both academic achievement in language and social skills in children through kindergarten. Several specific aspects of developmentally informed instruction are mentioned in this literature and a recent study by McDonald Connor et al. (2009) contends that best practice is based in a knowledge and understanding of quality instruction, and is not necessarily intuitive. These investigators found aspects of grade one classroom instruction that were associated with achievement in foundational literacy skills. Included is an individualized approach to instruction that, while carefully planned, readily adapts to the arising needs of students. They found that such instruction requires a diagnostic element, further supported by Burchinal et al. (2008) who found that academic gains in kindergarten is related to instruction that is rich in informative feedback and that academic gains were related to instructional scaffolding. These recent findings on the value of quality classroom assessment to student development extend the influential work of Black & Wiliam (1998) who found evidence that informative feedback is an essential element of classroom practice that leads to increases in student achievement.

The findings of Rimm-Kaufman et al. (2005) suggest that small group settings and high quality teacher-child interactions are associated with social exchanges among kindergarten peers that are important for development. Burchinal et al. (2008) found that kindergarten children appear to learn more and to better retain their achievements in classrooms where instruction is clear and when students are encouraged to communicate and reason using language skills. A report of a study by Pianta et al. (2007) found that a rich instructional climate and teacher sensitivity correlated with gains on standardized achievement tests not only in early childhood classrooms, but also in grade five.

Classroom management quality. Instructional practices are closely related to the quality of

classroom management, which is another classroom process that is believed to support healthy development in children. In a recent study, Rimm-Kaufman et al. (2009) found that using proactive management and varying approaches to instruction in kindergarten is associated with behavioral and cognitive self-control and student engagement. Quality management in the classroom is clear (Brody, et al., 2002; Burchinal, et al., 2008) and predictable (Rimm-Kaufman, et al., 2005), and quality management is associated with student engagement, self control, restraint, behavior self regulation (Rimm-Kaufman, et al., 2009) and increased and sustained achievement in early childhood classrooms (Burchinal, et al., 2008).

In a study of seven to fifteen year old children in 277 single parent African American families, Brody (2002) found that student reported classroom organization, rule clarity, and student involvement was associated with the development of self-regulation. This study indicates that such quality classroom processes can "protect and stabilize children's psychological functioning, even when they experience little competence-promoting parenting" (p. 283). The study also found that quality parenting might help to protect the healthy development of children who find themselves in poor quality classrooms.

Quality teacher-child interactions. Along with instructional and management quality, a strong theme in the recent research that looks at classroom processes from a developmental perspective is that the quality of teacher-child interactions can make a difference in the healthy development of children (Mashburn, et al., 2008; Pianta, et al., 2007; Pianta, et al., 2008; Rimm-Kaufman, et al., 2005). For example, in a study of children in 671 public pre-kindergarten programs in 11 states, Mashburn (2008) found that teacher-child interactions were associated with the development of academic, language, and social skills. These researchers conclude that improved teacher-child interactions facilitate developmental aspects that impact school readiness

and that teacher knowledge and practice of quality emotional and instructional interactions should be a priority for those who wish to improve the effectiveness of state pre-K programs.

Similar studies are beginning to depict the nature of a quality teacher-student interaction. Burchinal et al. (2008) investigated classroom quality in 240 randomly selected pre-kindergarten programs in six states. Their study suggests that children benefit (increased learning and retention) from frequent, "positive, enriching interactions between teachers and children that encouraged children to communicate and to use language to develop reasoning" and that such interactions tended to occur when working with individual or small groups of children (p. 151). In their study of NICHD data on 791 primary and elementary students, Pianta et al. (2008) found that warmth in adult-child interactions was one consistent predictor of academic growth. In this study, warm interactions were characterized by supportive words, supportive gestures, and also teacher sensitivity. Sensitivity was defined as the recognition of, and comforting response to student needs. These researchers found that the ability to detect primary and elementary student needs and skill at responding to those needs is related to growth in both reading and math skills.

Emotional interactions and instructional interactions are closely related (Hamre & Pianta, 2005; Pianta, et al., 2008) and a reoccurring theme in the recent literature with a developmental perspective is that one type of teacher-child interaction that is particularly meaningful for children's development is that of specific, clear, positive, instructional feedback (Burchinal, et al., 2008; Mashburn, et al., 2008; McDonald Connor, et al., 2009; Pianta, et al., 2007; Pianta, et al., 2008).

The need for skilled teacher-student interactions may be more apparent in some instructional learning formats. In a study of 250 kindergarten children, Rimm-Kaufmann et al. (2005) found that some classroom settings, such as small group structures, may place greater

demands on children's self-regulatory abilities, and that predictability in teacher-student interactions were related to the development of self-control, restraint, and behavioral self-regulation. Thus, interactions are also closely related to classroom organization.

Emotional interactions, instructional interactions, and classroom organization are currently considered by some to be the major components of classroom quality. In developing the Classroom Assessment Scoring System (CLASS), a classroom observation and evaluation system designed to measure the quality of teacher- student interactions, researchers have divided interactions into three major domains; emotional supports, instructional supports, and organization. Arguing recently for the value of using a standardized observation tool to help in improving teaching, Pianta and Hamre (2009a, 2009b) present a conceptual framework for classroom interactions that was used to develop CLASS. The framework includes three domains of quality interactions, all of which are present in the recent literature discussed above. The three domains are emotional supports, classroom organization, and instructional supports. Pianta et al. (2007) note that the impact of these three domains are supported by an exploration in England of classroom practice in which Sammons, Taggart, Siraj-Blatchford, Sylva, and Melhuish et al. (2006) found a similar association between the emotional, organizational, and instructional aspects of year five literacy instruction. The CLASS observation tool, designed for use in pre-kindergarten through grade twelve classrooms, looks at each of these three domains, as it assesses global classroom quality.

Pianta and Hamre conclude that:

> Students' interactions with teachers either produce or inhibit developmental change to the extent that they engage, meaningfully challenge, and provide social and relational supports for youth. In this sense, these interactions reflect a classroom's capacity to promote positive youth development. (2009a, p. 33)

Quality teacher-student interactions are currently considered a key to healthy development by several investigators who take a developmental perspective.

Quality teacher-child relationships. A final aspect of classroom practices that are related to healthy development is the quality of teacher-child relationships (Crosnoe, et al., 2004; Hamre & Pianta, 2001; O'Connor & McCartney, 2007). In a study that followed 179 students from kindergarten through grade eight, Hamre & Pianta (2001) found that negativity in teacher-child relationships were associated with both academic and behavioral outcomes. Crosnoe et al. (2004), who studied the National Longitudinal Study of Adolescent Health data on students in grades seven through twelve, found that:

> Contrary to common depictions of an opposition between young and old in secondary school settings, adolescents and teachers did form positive, affective relationships. Moreover, these relationships played an important role in education that was on par with more commonly studied demographic factors. Across all groups, students who had more positive views of their teachers did better and had fewer problems in school, while those with more negative views did worse and had greater problems. (p. 75)

Additionally, in a study of 880 children from the NICHD Study of Early Child Care and Youth Development, O'Connor & McCartney (2007) found that the negative effects of poor maternal attachment might be cushioned by high quality teacher-child relationships. They join others in concluding that positive teacher-student relationships are central to the healthy development of children.

Child and adolescent development in teacher education. Knowledge of child development is generally a goal of teacher education. While there are very few studies of investigating child development courses in teacher education, in an October 2005 survey of

NCATE accredited institutions, 90% of the participants reported that their teacher candidates are required to take a course in child and adolescent development (Eunice Kennedy Shriver National Institute of Child Health and Human Development & National Council for the Accreditation of Teacher Education, 2007). Most of the reporting institutions offer such a class as part of the education program. Additionally, two-thirds of the respondents reported that their teacher candidates were assessed by college supervisors and cooperating teachers using observation instruments on the application of knowledge of child development to the classroom.

Conclusion. None of the researchers from these studies suggest that knowledge of child development should not be applied to the classroom. Midway through the past decade, Van Horn et al. (2005) concluded that inconclusive or mixed findings are the result of research elements that lack power, such as self-report measures, observer ratings, secondary analysis, and lack of rigorous or appropriate procedures. Several more recent studies that take a developmental perspective, however, while descriptive and correlational in nature, appear to be not only more powerful in design, but more congruent in their conclusions. Nearly all recommend further research on this topic. Some districts have implemented programs that place principles of child development central to practice, and have reported positive results in student achievement and other indicators of success (Comer, 2005). NCATE (2007) continues to move toward standards that are intended to strengthen the application of knowledge of child development to teaching and learning. Initiatives that profess to make significant differences in the education of children should be investigated.

As noted above, many policy makers are currently watching teacher education with a critical eye. Experts have noted a lack of theoretical application by teachers in the classroom, and look to teacher education to close the gap between theory and practice. Probable outcomes include an increased emphasis on pre-service practicum experiences. Also, there will likely be

encouragement from accrediting agencies to improve the collection and assessment of data on both the emphasis on application in coursework, and the ability of candidates to apply theoretical knowledge in practical ways in the classroom. NICHD and NCATE have called for conversations about helping candidates to connect their knowledge of child development to classroom practice (National Council for the Accreditation of Teacher Education, 2008).

This study is one researcher's response to that call. It is an original investigation on available data that may reveal a better understanding of the application of knowledge of human development to teaching and learning by student teachers at one comprehensive university. Similar bodies of data are likely available in other teacher education programs, however, no published studies of this data in relation to an applied developmental perspective were found in educational research journals.

The theoretical and empirical literature presented here demonstrates clear connections between knowledge of human development and teaching. While earlier studies tended to be philosophically bent toward the NAEYC perspective, more recent studies have begun to provide a clearer empirical picture of the nature of developmentally appropriate practice in the classroom. As a local response to a national concern, it is hoped that this study will inform continuous improvement as local teacher educators seek to develop outstanding teachers.

Chapter Three: Method

Chapter three includes the methods used to conduct the study, including details about the goals, the setting, the research design and analysis procedures, human subject safeguarding, and a detailed description of the materials being studied.

Goals

The purpose of this study was to explore how items on the Full-Time Student Teaching Summary Report (FSTSR) that includes the assessment of practice that is developmentally informed, may or may not predict a global measure of student teacher proficiency. This study was a secondary analysis on ratings of proficiency from FSTSR forms that were completed by both university supervisors and cooperating teachers on a population of 462 student teachers, over three years. The following research question will be asked: How accurately can a measure of overall student teacher proficiency be predicted from a combination of measures of student teacher performance that include indications of a developmentally informed perspective?

Setting

The student teachers whose evaluations were investigated in this study attended a private, comprehensive university in the northwest. In the fall of 2006, in the midst of the time that the data for this study was being created, the enrollment was 3,149 undergraduate and graduate students, with a known minority population of about 10% (77.6% white, 9.9% minority, 1.1% non-resident alien, and 11.4% unknown) (Worthington & Buchanan, 2007). Some of the students who were preparing to become teachers attend classes on the university's residential campus, while others attended at several other northwest teaching sites. These teacher candidates participated in programs configured in one of three methods of delivery. Approximately 20 student teachers each year completed the traditional undergraduate teacher preparation program. Many more, around 130

student teachers each year, completed the Masters of Arts in Teaching (MAT) program. This graduate program is offered in three formats: Full-time, Night, & Community. All of the MAT students already have some type of undergraduate degree and are continuing their studies in order to obtain a graduate degree and to be qualified for a teaching license (School of Education, 2009).

An additional method of delivery is called Alternative Pathways. This is a graduate program primarily for students who wish to obtain teacher licensure requirements, but who already have some level of education training or experience or who have already been trained in a specific curriculum area, such as Music, Foreign Language, or advanced Mathematics. Because of the small number of Alternative Pathways candidates that were assessed in the data to be studied, and also because these candidates frequently have previous professional teaching experience, which sets them apart from the pre-service candidates, data from this delivery method was not included in this study.

Research Design and Analysis Procedures

This investigation was a secondary analysis of existing data on SOE students, from one private comprehensive university in the northwest, who were evaluated during student teaching over three years. In this study, the unit of analysis is a student teacher who was evaluated at some time from the fall of 2005 to the spring of 2008. Evaluators utilized two similar versions of the Full-Time Student Teaching Summary Report (FSTSR) as an assessment tool during the three years of data being investigated. A copy of the two versions of the FSTSR forms is included in Appendix A.

The FSTSR documents are found in candidate files. Each file in the population to be studied was assigned a case number. Scores were collected from the population of FSTSR forms that were completed on candidates who successfully completed their student teaching between the

spring of 2005 and the fall of 2008, or three academic years. In all, the research included the secondary analysis of 36,036 scores on 462 FSTSR documents. All of the ratings on each of the evaluation documents were gathered. Some of these ratings include the assessment of teaching practice that is appropriate to student's level of development (items 1a through 1g and item 2b). Each of the items on the FSTSR are directly associated with one of five TSPC standards. These items and standards and the history of their development are further clarified below, under *Materials*.

Because all of the student teachers in this population were judged as having "met" the requirements of student teaching, in this study, missing scores were treated as having "met" the proficiency, and were assigned the score of three (3). The score of three is indicated, in the directions, as being the score that represents a minimum level of proficiency. Additionally, a score of three is in the middle of the scale, and can also be interpreted as being neither high, nor low. Currently, evaluators of the FSTSR have been asked to score a three rather than mark an item as "not applicable". It was decided in this study to treat missing scores as a three because, that score is neither high nor low, and it is not believed that a missing score was typically an indication of a low score. This decision to treat missing scores as a three was made in consultation with a faculty member who is very familiar with the teacher education program and with the FSTSR assessment process. Other choices could have been made, such as treating the score as a zero, or throwing out the cases with missing scores. Making a different choice would likely have impacted the outcome of the study, therefore, the choice to make missing scores a three (3) is listed below as possible limitation.

In this study, the predictor variable (IV) was a combination of the measures, detailed below, which include indications of a developmentally informed practice (items 1a through 1g and

item 2b). The criterion variable (DV) was a global measure of overall student teacher proficiency. This global measure is referred to here as the student teacher proficiency index (STPI), and is the sum of all 39 of the measures on the FSTSR for both the university supervisor and the cooperating teacher. In order to conduct this investigation, each of the 39 scores on the FSTSR, for both the university supervisor and the cooperating teacher (a total of 78 scores for each form) was collected to an SPSS data file for further investigation.

Data collection. As this investigation was a secondary analysis of scores that were collected between the spring of 2005 and the fall of 2008, data was collected from approximately 462 FSTSR forms that were completed on candidates who successfully completed their full-time student teaching during those years. Because these students were in both undergraduate and MAT formats, and because these formats are centralized in two different locations, the files holding the FSTSR forms of interest are not currently all stored in the same area. The plan to collect this data began with a preliminary accounting of how many candidates who completed student teaching were scored, in each program and for each year. From this preliminary accounting, and from a careful study of the structure of the FSTSR form, a clear framework, into which to collect data, was carefully designed and built into the SPSS statistical software program. The SPSS framework reflected the structure of the FSTSR form. It also reflected the accounting of how many forms there are in each program, and in each year. Cells in which data was collected were clearly labeled to reflect the way that data is labeled on the FSTSR form. Careful attention to the framework, as it is built into SPSS, was important for at least two reasons: 1) It is desirable that the data be clear to those who may want to revisit the data in the future, but who were not involve in the current proposed study, and 2) a clear SPSS structure should make it obvious when some types of errors may be made in data entry. If a score was skipped, for example, it should be apparent that that

section in SPSS is not complete, and the data should be revisited. If a student teacher file which holds the FSTSR form was skipped or overlooked, it should be apparent, in SPSS, that there is an unexpected number of files in that program for that year, and to resolve this, the data would be revisited. The laptop computer holding the SPSS program was taken to where the files are being stored, and the data from the FSTSR form was added one file at a time, being careful to replace the student teacher files exactly as they were found. Carefully following this process, 36,036 scores were collected from FSTSR forms in 462 candidate files.

Analysis. It was proposed that a multiple regression analysis be conducted, on data from FSTSR forms, to evaluate how accurately a measure of overall student teacher proficiency could be predicted from a combination of measures of student teacher performance that include indications of a developmentally informed practice? It was believed Multiple linear regression analysis might allow the prediction of a score on one variable from the scores on multiple independent (predictor) variables (Green & Salkind, 2008). The multiple linear regression procedure finds the line through a three-dimensional data cloud of plots that most minimizes the difference between the data plots and the fitted line. In this case, the analysis is used to seek a prediction on a score of overall student teacher proficiency from the scores on multiple items from the FSTSR that include indications of a developmental perspective. In the course of implementing this study, other additional statistical procedures were found to be appropriate. These included a test for the reliability of the data and, in response to a secondary hypothesis, a factor analysis procedure. These procedures are thoroughly explained in chapters four and five, as they were process that were added in the course of the study.

Human Subjects Safeguarding

As this was a secondary analysis of existing data, permission to use data from each individual teacher was not required. However, appropriate letters of cooperation were obtained from the university directors over each of the three methods of delivery. The names of the student teachers that have been evaluated were kept confidential and were not be included in any of the written reports. All of the documents that connect data to individuals were returned immediately following data collection to university storage, or kept in a locked file until they are destroyed.

While the name of the university will typically be excluded from the reports, it is reasonable to expect that those who attend a presentation of this research may easily conclude that it was completed where the investigator is/was a student and a teaching professor. It is feasible that results from this research will indicate areas of weakness in specific areas of the university teacher preparation program. Whether or not this is the case, presentations will indicate that it is the professional practice of this SOE to regularly reflect upon, and evaluate, the strengths and weaknesses of the program with the goal of continuous improvement as a process.

Materials

This investigation was a secondary analysis of existing data on 462 SOE candidates from one private comprehensive university in the northwest. Candidates were evaluated during student teaching over three years, from the fall of 2005 to the spring of 2008. During these three years, the assessment tool used to evaluate student teacher proficiency at the end of the full-time student teaching experience was called the Full-Time Student Teaching Summary Report (FSTSR). This tool has been revised and modified multiple times over the past decade.

History of FSTSR development. In a February 1991 report, the Teacher Standards and Practices Commission (TSPC) acknowledged the leadership of the Oregon Association of Colleges for Teacher Education (OACTE) in developing the assessment framework that became

the foundation of the student summary evaluation materials being investigated in this document. The TSPC specifically noted the contributions of Elizabeth Clewett of the University of Oregon; John Tenny of Willamette University; Vern Jones and Carol Witherell of Lewis and Clark College; and David Myton and Dan Osterman who were with TSPC (Oregon Association of Colleges for Teacher Education & Oregon Teacher Standards and Practices Commission, 1991). The 1991 framework which they created was introduced to teacher preparation programs in Oregon Colleges and Universities via a Student Teacher Summary Report manual, which included a sample of a Student Teacher Summary Report to be used by college supervisors and cooperating teachers to "evaluate candidate performance on TSPC-prescribed teaching competencies" (Oregon Association of Colleges for Teacher Education & Oregon Teacher Standards and Practices Commission, 1991, p. 20). The sample document was divided into four areas of competence: 1) Planning for Instruction, 2) Establishing a Classroom Climate Conducive to Learning, 3) Implementing Instructional Plans, and 4) Evaluating Pupil Achievement.

Much of the language used in this 1991 sample is still in use in the later documents being investigated here. Item 1a, for example, which reads, "Selects and organizes instructional materials and equipment needed to teach the unit of instruction" is almost word for word the same in the more recent assessment tools, though in the 1991 tool, a section heading which unifies each statement had not yet been added (Oregon Association of Colleges for Teacher Education & Oregon Teacher Standards and Practices Commission, 1991, p. 20). It is clear from the language used in this early sample that it is the predecessor of the FSTSR forms that provided the data to be investigated in this proposed study.

This manual, and the included sample assessment document, resulted from a then new approach to state teacher certification. Oregon was beginning to take an "outcomes" orientation to

teacher licensure and program approval, and the two new key pieces of this approach would be successful preparation of work samples, and satisfactory performance in student teaching. "Satisfactory performance" meant that candidates could demonstrate competency in the TSPC performance objectives, presented in the form of four sets of competencies, listed above. Oregon's new approach to licensure and program approval was the result of findings presented in 1986 by a Legislative Interim Committee on Education, co-chaired by House Speaker Vera Katz and Senate President John Kitzhauber. The committee took note of the reform literature of the early 1980s that criticized the quality of teacher candidates and their professional preparation. The committee believed changes needed to be made to avoid "an imminent crisis in Oregon's elementary and secondary schools" (Oregon Association of Colleges for Teacher Education & Oregon Teacher Standards and Practices Commission, 1991, p. 2)" It is interesting to note that among the committee's recommendations was the abolishment of the undergraduate major in education.

Another recommendation was that Oregon should stop over-regulating the structure of teacher preparation programs in Oregon colleges and universities. "Instead of regulating these program 'inputs,' the committee recommended that standards for program approval should evaluate the 'outcomes' of preparation programs" (Oregon Association of Colleges for Teacher Education & Oregon Teacher Standards and Practices Commission, 1991, p. 3). Thus, the TSPC extended student teaching from a minimum of nine weeks to a minimum of 15 weeks, with at least six weeks where candidates assumed full responsibility for teaching. Candidates would then be expected to demonstrate competence in TSPC performance objectives:

> Upon completion of student teaching, the candidate's performance on the TSPC-prescribed objectives is also evaluated by both the university- and field-based supervisor. A summary of the student teacher's performance on these objectives is then recorded at the institution

> on a standardized summary report form, and reported to the TSPC. (Oregon Association of Colleges for Teacher Education & Oregon Teacher Standards and Practices Commission, 1991, p. 6)

There was intent that the work sample would inform the summary report. Much of the data for the summary evaluations was to be drawn from the work sample, as well as from conferences, observation, and de-briefing activities (Oregon Association of Colleges for Teacher Education & Oregon Teacher Standards and Practices Commission, 1991, p. 6).

The original sample of the summary report, presented in 1991, had one place for each of the supervisors and cooperating teachers to check (met, or not met) for each of the four areas—with only eight places to mark per form; four marks for the supervisor, and four marks for the cooperating teacher. The FSTSR, as it was used at the university in this investigation, looked about the same until 1999 when it changed from four areas to the five areas that are still used today. The description at the beginning of each of the five areas took the form of the first half of a statement:

> Area 1. "Candidates plan instruction that supports student progress in learning and is appropriate for the developmental level and demonstrate they are able to:"
>
> Area 2. "Candidates establish a classroom climate conducive to learning and demonstrate they are able to:"
>
> Area 3. "Candidates engage students in planned learning activities and demonstrate they are able to:"
>
> Area 4. "Candidates evaluate, act upon, and report student progress in learning and demonstrate they are able to:"
>
> Area 5. "Candidates exhibit professional behaviors, ethics, and values, and demonstrate they are able to:"

The wording on these introductory statements for the FSTSR remains unchanged (see appendix). At about the same time the tool went to five sections, the FSTSR took on a new look. Instead of a simple, "met" or "not met" for each of the five sections, the form now included a three point rating scale for each item in each of the five areas. There were 39 individual items to rate, just as it remains today. Supervisors and cooperating teachers now had ten times as many marks to make on each form. For each item, a score of one (1) meant, "emerging competency." A score of two (2) meant, "proficient", and a score of three (3) meant, "exceeds expectations."

In 2005, the FSTSR changed to a zero to six point scale. The ratings were described as follows:

Zero: "Not yet able to demonstrate the knowledge, skills, and competencies needed to meet the needs of many learners"

One or Two: "Developing an awareness & beginning to demonstrate the knowledge, skills, and competencies needed to meet the needs of most learners.

Three or Four: Knows and demonstrates the methods, skills, and strategies needed to meet the needs of most learners.

Five or Six: Knows and demonstrates well the methods, skills, and strategies needed to meet the needs of most diverse learners.

The descriptions for these ratings remain the same on the assessments that were investigated in this study (see appendix A). The form states that student teachers "should be able to demonstrate proficiency at a level 3 or 4 for each of the knowledge, skills, and competencies in order to earn the Initial Teaching License."

Selection of data for this study. Assessment documents from the fall of 2005 to the spring of 2008 were selected for this study because they are the three years when the FSTSR is most

likely to be in a form where consistent data can be collected over time. In 2005, the FSTSR moved from a three-point (1-3) to a 7-point scale (0-6). After the spring of 2008, some of the assessments began to be modified so that they could be completed and delivered on-line. In fact, even during the three years in the proposed study, two slightly different versions of the FSTSR were used. The earlier version was used exclusively during the 2005/2006 assessments. The newer version was used exclusively during the 2007/2008 assessments. A mix of these two tools was used to assess student teachers during the 2006/2007 academic years. It is reasonable that evaluators felt free to use both tools during this year, as the modifications from one to the next were very small. A brief description of these modifications is made below.

Two similar FSTSR versions. Over the years, slight changes in wording have been made that probably reflect the changing culture and beliefs of teacher education over time. Such examples can be seen in changes made to the 2006 version of the assessment from the 2005 version. Data is used from both of these versions in this study, which is why careful attention has been made to each change and the impact it may make on the present study. In the newer version of the document, items 1f and 4a add the words "all learners" without changing the basic target. This change may have reflected a current educational culture that emphasized the meeting of individual needs of all students, rather than providing an "individual education program" (IEP) for just a few. Item 2d was changed to include the idea of teachers who support development, adding the only truly new target to the assessment. The chair of the undergraduate teacher education program made this change in anticipation of the coming national policy level emphasis encouraging candidates to apply knowledge of development to the classroom. A slight change in item 2e emphasizes knowledge of influences on students outside of the classroom, which is similar to a small addition to item 5e, which encourages candidates to recognize the impact of culture on

student learning. Finally, item 2g changed the word "parents" to "families", and in item 3d, the phrase "encouraged parent participation" was eliminated. Both of these may have been an effort to be more inclusive of the diverse structure of student homes in today's society. With the exception of the change in item 2d, emphasizing the support of student development, the fundamental target of the other items do not appear to change. In this investigation, therefore, data from both of these versions were used, taking carefully into account the change in item 2d, and making appropriate adjustments to limit the chance of inappropriate conclusions. These considerations will be further discussed below.

Accommodations for the small changes in the FSTSR. While each of the versions have 39 items, the newer tool has a few slight changes in wording, and one item (item 5g on the newer tool, item 4d on the older tool) was simply moved from section 4 to section 5, without any change. The slight changes in wording appear to be intended to clarify the intent of the item. For example, item 1f on the older form states, "Adapt unit and lesson plans for exceptional learners and for students with varying cultural, social and linguistic backgrounds". In the newer version of the FSTSR, the phrase "exceptional learners" was changed to "all learners," and the words "and for exceptional learners" was tagged on to the end of the item. It now states, "Adapt unit and lesson plans for *all* learners and for students with varying cultural, social and linguistic backgrounds *and for exceptional learners.*" The addition does not change the focus or intent of the item, but simply makes it clear that adaptations to unit and lesson plans should be beneficial to *all* learners. The fundamental content of the item has not changed. This is typical of the other slight changes in wording that were made on the later version of the FSTSR.

One exception to this is item 2d. In the earlier version of the FSTSR, item 2d focuses on classroom management: "Establish and maintain classroom rules and procedures, model

appropriate social behavior, and provide meaningful reinforcement when it occurs." This item has similarities to item 2b on the older form, which states, "Communicate classroom rules and behavioral expectations that provide a safe and orderly environment for learning, are appropriate to the level of development of students, and are consistent with laws governing student rights and responsibilities." In the later version of the FSTSR, the word, "Establish" in item 2d was simply moved to item 2b, so that it now reads, "Establish, communicate, and maintain rules….." Then item 2d was re-written to reflect the evolving national interest in applied development. In the newer version of the FSTSR, item 2d reads, "Model and reinforce social behavior that supports student learning and development". This construct of instruction that supports development was not present in the earlier assessment. This is the one item that significantly changes in content from the older version of the FSTSR to the newer version. It impacted the study, in that, though the item on the later version includes indications of a developmental perspective, it was not be included in the combination of measures of student teacher performance that include indications of developmentally informed practice, because it is not present on the earlier version of the FSTSR.

In this study, the student teaching proficiency index (STPI) taken from the older version of the FSTSR was considered equivalent to the STPI derived from the new version. This choice was made with an understanding that the small changes in the document that are indicated above, will likely result in the two versions of the FSTSR actually measuring small differences in the construct of overall student teacher proficiency, but it is not believed that those differences are so great, that the two versions of these FSTSR can not both be use for this study, if the few considerations mentioned above are taken into account.

Items that indicate developmentally informed practice. While all of the ratings from the FSTSR were considered in this study, several items in the assessment are measures of student

teacher proficiency that include indications of a developmentally informed practice. These measures are the predictor variables in the study. The heading for all of the items under section one states: "Candidates plan instruction that supports student progress in learning and is appropriate for the developmental level & demonstrate they're able to…." This item asks evaluators to consider how candidates have used their knowledge of development for appropriate instructional planning. Immediately following this heading are seven specific items (a through g) related to instruction that are each rated by the evaluator on the zero to six scale, detailed above. Because the heading specifies that each of these proficiencies should be appropriate for the developmental level of students, all seven of these items were considered measures that indicate teacher proficiency that is associated with applied knowledge of student development.

Two other items on the Full-Time Student Teaching Summary Report also specifically evaluate the application of knowledge of human development to teaching and learning. Item 2b, when combined with its heading, reads, "Candidates establish a classroom climate conducive to learning & demonstrate they're able to establish, communicate, and maintain rules, procedures and behavioral expectations that provide a safe and orderly environment for learning, are appropriate to the level of the development of students, and are consistent with laws governing student rights and responsibilities." This item asks evaluators to consider if classroom management is developmentally informed. Therefore, it was included as one of the measures that indicate teacher proficiency that is associated with applied knowledge of student development.

Secondly, item 2d reads, "Candidates establish classroom climate conducive to learning & demonstrate they're able to model and reinforce social behavior that supports student learning and development." This item specifically asks evaluators to consider if the student teacher has exhibited practices that support development. Unlike the above items, however, item 2d does not

appear on the 2005/2006 version of the FSTSR. This study includes three years of FSTSR data, which includes assessments from the fall of 2005 to the spring of 2008. Item 2d, therefore, was not included in the combination of measures of student teacher performance that include indications of a developmental perspective?

Preliminary Limitations

The teacher preparation unit being studied uses several gate assessments as students progress through their program, in part, to prevent candidates from getting all the way to the end of student teaching and, only then, finding themselves unsuccessful. As a result, there are very few examples of completed FSTSR assessments that indicate that candidates were not proficient enough to move ahead toward licensure. The fundamental focus of this study is the proficiency of student teachers that were eligible to go on to their own classrooms. As the study only investigated the Full-Time Student Teaching Summary Report form's of students who successfully completed the program, it was expected that the STPI scores will be somewhat negatively skewed, with more scores toward the higher end of the range. It should be noted that the study did not represent the assessments of any student teachers whom may have done so poorly on the FSTSR assessment that they were not able to complete their student teaching. The population for this study only includes data on students who successfully completed student teaching.

It is, in part, for this reason that it was decided to treat missing scores as a three, or as having "met" the requirement, which is the case for each of the student in this population. A choice to treat missing variable differently would likely impact the results of the study. Making any missing scores into a three will likely move the average score somewhat toward the middle of the scale.

It is also noted here that a probable limitation of this investigation will be the slight changes in the FSTSR over the course of the three academic years being studied. While, for the purposes of this study, the index of overall student teacher proficiency (STPI) is considered to be equivalent in both the older and newer versions of the FSTSR, it is recognized that that there are actually small differences in the STPI from one version to the next. It was expected that another limitation would be weaknesses in the assessment tool, which was used to collect the data (remember that this is a secondary analysis of existing data). For example, item 2b, stated above, has numerous components resulting in lack of clarity. If the item were given a low rating, it would be impossible to know exactly which of the components the evaluator marked down. Keeping each item to one construct would result in much more clarity for those who read the ratings. At best, one can say that practice appropriate to the level of development of students is a component of the item being rated. No studies were found that indicate the strength of the validity or reliability of the FSTSR tool. Any validity of the measure is limited to the clear connections in the items to state standards and the record of continuous development by professional teacher educators. While it would seem that inter-rater reliability may be possible because there are two evaluators on each instrument, there is great possibility, because of the built in end-of-experience conference between the university supervisor and the cooperating teacher, that the ratings are not done independently, which would likely impact the result of such analysis. Other limitations are recorded at the conclusion of this study.

Conclusion

This investigation exploring the proficiency of pre-service teachers' application of knowledge of child development to teaching and learning in their full time student teaching has been particularly meaningful for the researcher, as teaching classes in applied human development

for teachers has been a concurrent activity. This helped to give the project meaning, and made the study a timely topic at a personal and professional level.

Chapter Four: Results

In chapter four, the findings of the exploration of the data collected from FSTSR documents are reported. This includes: (a) descriptive statistics from the 462 FSTSR documents examined, (b) reliability of the data, (c) multiple regression analysis results, including item correlations, and (d) a factor analysis of the FSTSR measure.

Descriptive Statistics

Candidates. This study was a secondary analysis of data collected from FSTSR documents from the School of Education at one private comprehensive university in the northwest. Each FSTSR examined in this study included assessment scores from a university supervisor and a cooperating teacher on a candidate who successfully completed student teaching. Table 1 includes descriptive data from the 462 completers from three different academic years. There were 164 candidates in 05/06, 156 candidates in 06/07, and 142 candidates in 07/08.

Table 1
Count of Candidates who Completed Student Teaching over Three Different Academic Years, by Program.

	Academic Year			
	05/06	06/07	07/08	All
Undergrad	25	21	20	66
MAT FT	60	62	47	169
MAT Night	44	40	31	115
MAT Comm	35	33	44	112
All	164	156	142	462

Note: $n = 462$

About 85% of the participants over the three years investigated in this study were in one of the three MAT programs, and the rest were in the undergraduate teacher education program. The MAT Full-Time program had the most candidates, and made up just over 36% of this study. The MAT Night and MAT Community programs each had about one quarter of the population of

student teachers, and just over 14% of the candidates were from the undergraduate program. The undergraduate program, MAT Full-Time, and MAT Night each had their fewest number of candidates student teaching in the final year of this three year study (07/08), contrasted by MAT Community, which had its largest number of candidates complete student teaching in that third year.

Table 2 reports the frequencies reported as the candidate's primary content area. Well over half of the candidates reported a Multiple Subjects focus. During the three academic years studied, all of the undergraduate candidates sought a multiple subject authorization. In the MAT programs, History/Social Studies, Literacy, Math, and Science were each about 6% to 8% of the content areas. Foreign Language, the Arts, and Health/PE each made up about 2% to 3% of the content areas. Less than 2% reported other areas of content not mentioned above.

Table 2
Count of Completing Candidates in each Content Area, by Program.

	Program				
	UG	MAT FT	MAT N	MAT C	All
Mult Subjects	66	90	67	68	291
History/SS	0	15	15	8	38
Literacy	0	13	8	11	32
Science	0	14	8	6	28
Math	0	12	8	8	28
Mus/Art/Dra	0	10	0	4	14
Health/PE	0	7	3	3	13
Foreign Lang	0	5	4	1	10
Other	0	3	2	3	8
All	66	169	115	112	462

Note: $n = 462$

In the population studied, full-time student teaching was at the early childhood authorization level for 99 candidates (21.4%) and at the elementary level for 192 candidates (41.6%). All of the EC and EL candidates were pursuing a multiple subjects authorization. Fifty-

two of the candidates (11.3%) did full-time student teaching at the middle level authorization and 119 candidates (25.8%) were at the high school level. Table 3 shows the subject areas for the middle level and high school candidates. Each of the content areas had more high school candidates than middle school candidates. The History/SS area had the most candidates in both the ML and HS levels. The Math (12/16) and Health/PE (5/8) content areas were most similar (ML and HS) in number of candidates, and the Science (6/22), the Arts (2/12), and Foreign Language (1/9) were most dissimilar.

Table 3
Count of ML and HS candidates by content area for 05/06, 06/07, and 07/08.

	Full-Time Student Teaching		
	ML	HS	Total
History/SS	14 (8%)	24 (14%)	38 (22%)
Literacy	10 (6%)	22 (13%)	32 (19%)
Science	6 (4%)	22 (13%)	28 (16%)
Math	12 (7%)	16 (9%)	28 (16%)
Mus/Art/Dra	2 (1%)	12 (7%)	14 (8%)
Health/PE	5 (3%)	8 (5%)	13 (8%)
Foreign Lang	1 (0.6%)	9 (5%)	10 (6%)
Other	2 (1%)	6 (4%)	8 (5%)
Total	52 (30%)	119 (70%)	171 (100%)

Note: secondary students only, *n*=171

FSTSR scores on items related to development. This study focused on scores on eight of the items on the 462 Full-Time Student Teacher Summary Reports that include the assessment of developmentally informed practice (items 1a through 1g, and item 2b). Table 4 includes descriptive data on these scores. Each of the items on the FSTSR was rated on a common, zero to six, scale. Descriptions of the items, as well as criteria for the zero to six ratings are detailed in chapter one of this study, and can be also seen on the copy of an FSTSR tool which is included in Appendix A. While the ratings on the FSTSR were on a common scale of zero to six, in all of the

462 documents, the score of zero was assigned only two times, and the score of one was assigned only three times. None of the scores for the development related items fell below a two, except for item 2b, which had a minimum score of one. A maximum score of six was present for all of the items. The means and standard deviations for the FSTSR scores of the university supervisors were similar to those by the cooperating teachers. Except for item 2b, where the means was the same for both type of evaluators, all of the cooperating teacher ratings tended to be slightly higher than the college supervisor ratings.

Table 4
Descriptive Data for FSTSR Scores from Supervisors and CTs on Items that Include Developmental Considerations

	Evaluator Scores					
	Supervisor		CT		All Scores	
Item	Mean	SD	Mean	SD	Mean	SD
1a	4.84	.79	4.87	.82	4.85	.80
1b	4.72	.78	4.83	.81	4.78	.79
1c	4.91	.77	4.92	.81	4.92	.79
1d	4.84	.80	4.90	.85	4.87	.83
1e	5.10	.73	5.13	.82	5.12	.77
1f	4.54	.91	4.69	.94	4.61	.93
1g	4.57	.84	4.59	.90	4.58	.87
2b	4.86	.87	4.86	.92	4.86	.89

Note: FSTSR n = 462; 0 to 6 scale

Student Teacher Proficiency Index. Each FSTSR includes ratings by both a supervisor and a cooperating teacher. Each evaluator rated 39 items; therefore, each FSTSR included 79 ratings on a common zero to six scale. The STPI was created for this study by summing the 79 ratings by both the Supervisor and the CT. *Figure 1* displays a stem-and-leaf plot representing the Student Teacher Proficiency Index score on each of the candidates who completed student teaching during the three academic years included in this study (n=462). A maximum STPI score, where each of the 78 ratings was a six, would be 468. The range of the STPI scores was 250 with a

minimum score of 218 and a maximum score of 468. While the scores approximate a normal distribution (*kurtosis* = .18), the STPI scores have a small negative skew (*skew* = -.54). There is also an abrupt spike of scores at the upper end of the index, with 10 (2.2%) of the 462 candidates receiving the maximum possible STPI score of 468. The mean STPI score was 385.81, out of a possible 468, with a standard deviation of 49.26. Approximately 68% of the STPI scores fell between 337 and 435 (1 SD unit), and approximately 98% of the scores fell from 287 to 468 (2 SD units). Seventeen of the students who completed student teaching, during the three years investigated, scored below two standard deviations from the mean. The bottom seven of those scores (218 to 256) are outliers, falling outside of the normal distribution.

```
Frequency
  7.00 Extremes (= < 256)
  1.00      2 .  5
  7.00      2 .  6667777
  9.00      2 .  888899999
 19.00      3 .  0000000011111111111
 33.00      3 .  222222222222233333333333333333333
 50.00      3 .  44444444444444444444445555555555555555555555555555
 72.00      3 .  666666666666666666666666666666667777777777777777777777777777777777777
 75.00      3 .  888888888888888888888888888888888899999999999999999999999999999999999999
 63.00      4 .  000000000000000000000000000000000000011111111111111111111111111
 55.00      4 .  222222222222222222222222222222333333333333333333333333333
 45.00      4 .  444444444444444444444444455555555555555555555555
 26.00      4 .  66666666666666666666666666

        Stem width = 100.00
        Each leaf = 1 case
```

Figure 1. Stem-and-leaf plot representing the Student Teacher Proficiency Index (STPI) score on each of the 462 candidates who completed student teaching during 05/06, 06/07, and 07/08.

Reliability

A measure is considered reliable if it produces consistent results as it is utilized over time (Green & Salkind, 2008). Kachigan (1991) asserts that "the notion of reliability is basic to every measurement situation" (p. 139). One of the first steps in this study, therefore, was to determine if the raw data that was being investigated has meaning, and is not a merely a set of random scores.

When a reliable assessment is repeated, subsequent appraisals result in data that is reasonably consistent with the first.

Before conducting an internal consistency estimate of reliability, high and low scores, means, and variances of the FSTSR scores in each of the five sections were carefully examined for anomalies. None were found. Green and Salkind (2008) state that "if the responses to items on a scale are in the same metric, and if high scores on them represent high scores on the underlying construct, no transformations are required" (p. 325). Such is the case on the FSTSR. All of the scores are on a zero-to-six metric, and, in every case, a six represents strength of concept. The FSTSR includes five sections. Each section includes items designed to measure a common construct. Section one measures planning for instruction. Section two measures the establishment of classroom climate. Section three measures standards based teaching. Section four measures assessment. Section five measures professional behavior. According to Green and Salkind (2008), it is unlikely that the parts of a measure are ever completely equivalent and, to the extent that equivalency is violated; reliability will tend to be underestimated.

An internal consistency estimate of reliability, the coefficient alpha, was computed for each of the five sections in the FSTSR. A coefficient of one would indicate perfect consistency. Green and Salkind (2008) state: "For the behavioral sciences, correlation coefficients of .10, .30, and .50, irrespective of sign, are, by convention, interpreted as small, medium, and large coefficients, respectively" (p. 259). Kachigan (1991), however, indicates that in the case of reliability coefficients, it is desirable to have a result "of at least .90, and hopefully higher" (p. 140). The values for coefficient alpha in each of the five sections of the FSTSR were .96, .97, .96, .93, and .96, respectively. The coefficients suggest that the scores from the measure are reliable, and may be suitable for further analysis.

Multiple Regression Analysis

The primary purpose of this study was to determine how accurately a measure of overall student teacher proficiency, the student teacher proficiency index, can be predicted from measures on the FSTSR that include the assessment of applied knowledge of development: items 1a through 1g, and item 2b. According to Kachigan (1991), multiple regression analysis is used when "we are interested in predicting an object's value on a criterion variable when given its value on each of several predictor variables" (p. 161). A multiple regression analysis procedure was conducted to evaluate how well the predictor variables; sixteen indicators of applied developmental knowledge on the FSTSR, predicted the criterion variable; overall student teacher proficiency (STPI). It was found that the linear combination of the predictor variables was significantly related to the STPI, $F(16, 445) = 328.98$, $p < .001$. The sample multiple correlation coefficient (R) was .96, which indicates that about 92% (R^2) of the variance of the STPI in this study can be accounted for by the linear combination of the selected measures that are associated with developmentally informed practice. The initial results of the analysis, therefore, indicated that these selected measures of student performance, when taken together, predict 92% of the score of overall student teaching performance.

Table 5 presents indices to indicate the relative strength of the individual predictors. As previously noted, correlation coefficients of ±.10, ±.30, and ±.50 are typically interpreted as small, medium, and large coefficients. All the bivariate correlations between the development measures and the STPI were both positive and large. After controlling for all other predictors, ten of the sixteen indices were found to be significant ($p < .05$), but small partial correlations. An examination of the findings reveals that, when controlled for by all other predictors, the coefficients of the independent variables were simultaneously reduced from very strong to small or

insignificant, which is an indication that the predictor variables are highly correlated.

Table 5
The Bivariate and Partial Correlations of the FSTSR Development Items with the STPI

	Correlation Coefficients		
Predictors	Bivariate Correlations between each predictor variable and the STPI	Partial Correlations between each PV and the STPI, controlling for all other predictors.	Sig
super 1a	.746	.161	.001*
ct_1a	.797	.086	.069
super 1b	.781	.103	.029*
ct_1b	.800	.074	.116
super 1c	.753	-.056	.239
ct_1c	.801	.239	.000**
super 1d	.764	.060	.209
ct_1d	.786	.049	.303
super 1e	.741	.135	.004*
ct_1e	.766	.200	.000**
super 1f	.723	.214	.000**
ct_1f	.773	.108	.022*
super 1g	.759	.135	.004*
ct_1g	.779	.074	.119
super 2b	.760	.240	.000**
ct_2b	.797	.266	.000**

*$p < .05$, **$p < .01$

The results of the multiple regression analysis indicate what Cohen, Cohen, West, and Aiken (2003) describe as the problem of multicollinearity. They state:

> Because the IVs involved lay claim to largely the same portion of the Y variance by definition, they cannot make much by way of unique contributions. Interpretation of the partial coefficients of IVs from the results of a simultaneous regression of such a set of variables that ignores their multicollinearity will necessarily be misleading.
>
> Attention to the R^2 of the variables may help, but a superior solution requires that the investigator formulate some causal hypothesis about the origin of the multicollinearity. If it is thought that the shared variance is attributable to a single central property, trait, or latent

> variable, it may be most appropriate to combine the variables into a single index or drop the more peripheral ones…. (p. 98)

Therefore, as a result of the findings from the multiple regression analysis, a hypothesis was formed that the FSTSR has a single central property, which led to the multicollinearity of the predictor variables. A procedure that is used to recognize factors that statistically explain the variation and covariation among measures is the factor analysis (Green & Salkind, 2008). The follow-up hypothesis of a single central property in the FSTSR was explored by conducting a factor analysis.

Factor Analysis

Initially, the primary constructs that are present in the 39 items of the FSTSR were explored without using a particular statistical analysis, but simply by looking carefully at the wording and meaning of each item. Evidence gained in this manner has been referred to as, "external," while "internal" identifies evidence based on a statistical solution (Gorsuch, 1983, p. 197). These terms will be used in the discourse that follows.

External constructs. A non-statistical analysis was done on the 39 items found on the Full-Time Student Teacher Summary Report. The major constructs in each item were given an identifying label by the researcher. This process of identifying and naming factors has been called, "more of an art than a science" and it is important to recognize the personal judgment of the researcher that is in this facet of a factor analysis (Kachigan, 1991, p. 258). The external analysis of the 39 FSTSR items resulted in 43 identified constructs (see Table 6). Seventeen of the items on the FSTSR were identified as having multiple constructs to assess. Eleven of the 43 identified external factors were found in more than one item. Factors that appeared three or more times include assessment, cultural competence, developmentally appropriate practice, differentiation,

instruction, instructional planning, and management.

Table 6
External constructs identified in the 39 FSTSR items

External Factors (*n*=43)	Items
Advisory functions	5h
Applied knowledge of bio-ecology	2e
Appropriate referrals	4c
Assessment	1b, 3f, 4a
Clear outcomes	3b
Collaborates with bioecology	5g
Collegiality	5f
Conflict resolution	2g
Content knowledge	3c
Coordinate support personnel	2k
Cultural competence	1f, 2g, 3d
DAP	1a, 1f, 2b
Dependable	5a, 5b
Differentiation	1f, 3d, 3f, 4c
Documentation for stakeholders	4b
Dress appropriately	5c
Equitable practice	2c
Focuses student interest	3b
Follows school policies	5d
Instruction	3c, 3d, 3e
Instructional planning	1d, 1f, 3a
Interact with parents/community	5f
Interactions with students & family	2g
Interdisciplinary team player	5i
Knows organizational culture	5e
Learning goals	1a,
Least restrictive environment	2c
Legality	2b
Management	2b, 2d, 2f
Materials management	1e, 2j
Objectives	1c,
Pacing	3f
Pedagogical content knowledge	1a,
Positive support	2a
Professional drive	5j, 5k
Promote critical thinking	3e
Reflective Practice	4d
Role model	2d
Seeks resources for students/families	5g
Technology	1e,
Time management	1g, 2h
Transition Management	2i
Value all learners	2a

Appendix B displays each of the five sections of the FSTSR and the externally identified

constructs that fall in each section. Eight of the identified constructs fall into more than one of the sections. Three of the constructs (assessment, cultural competence, and differentiation) appeared more than two of the sections. Section Five on Professional Behavior was the only section that did not have identified constructs that appeared elsewhere on the measure.

Internal Factors. The maximum likelihood factor analysis procedure was conducted to explore the internal dimensionality of the 39 items on the FSTSR. The procedure was applied first to the 39 FSTSR items as they were completed by university supervisors, and then again on the same items as they were completed by cooperating teachers. In the first phase of the procedure, an initial principle components analysis resulted in scree plots for both the university supervisor data and the cooperating teacher data, as seen in *Figure 2*. These suggest that the hypothesis of a single, central factor may be incorrect, and that two additional factors are indicated as probable.

The second phase of the factor analysis process includes rotating a determined number of factors. This helps to give the factors meaning, as they are grouped by the size of the values in the rotated factor matrix (Green & Salkind, 2008). A Varimax rotation was selected. The maximum likelihood factor analysis procedure was conducted, using a three factor solution, with first the supervisor data, and then the cooperating teacher data. As seen in Table 7, the analysis indicated three interpretable factors, refuting the single factor hypothesis. The label identifying each factor is an abstract selected by the researcher that seems to include the principle constructs of items that loaded to that factor. First, a *classroom teaching* factor accounted for 31.6% of the item variance in the supervisor data, and 37.8% of the item variance in the CT data. Second, a *professional dispositions* factor accounted for 16.6% of the variance in the supervisor data, and 19.9% of the item variance in the CT data. Finally, 17.6% of the variance of the supervisor data, and 11.2% of the variance of the CT data loaded onto the factor about *enlisting and facilitating student support*.

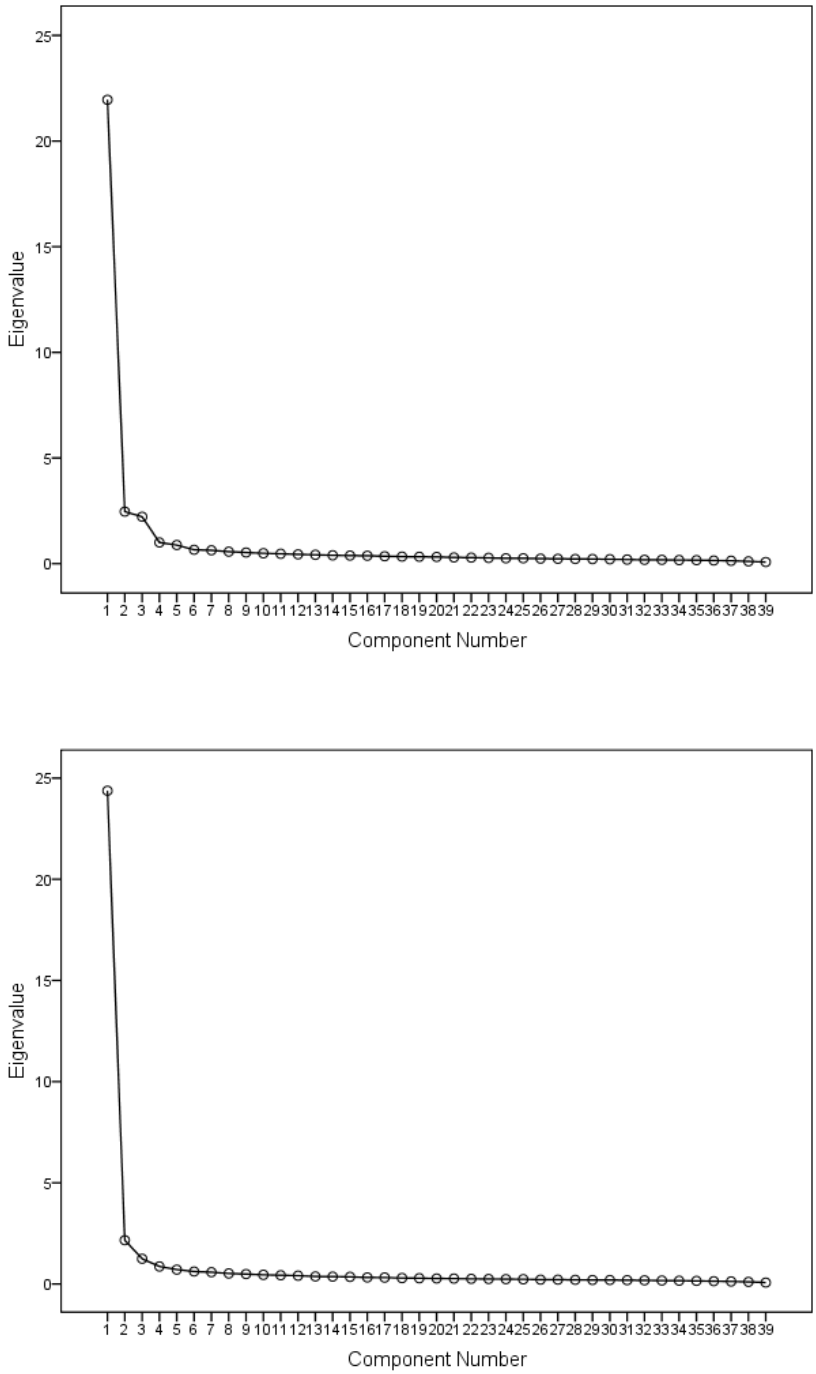

Figure 2. Two scree plots show the results of a factor extraction from the 39 FSTSR items as assessed by university supervisors (top), and cooperating teachers (bottom). In both of the scree plots, the steep decent criterion suggests that three factors be retained.

All of the FSTSR items loaded to their most highly correlated factor at a .5 or above. All of the CT items, except for the items from section five, loaded to the classroom teaching factor. Most of the

supervisor items also loaded to the classroom teaching factor.

Table 7
Summary of factor analysis (three factor solution) of the FSTSR

Factors and FSTSR Items	Factor loadings (sorted by Supervisor)	
	Supervisor	CT
Factor I: Classroom teaching	31.57% of Variance	37.82% of Variance
2b: Management, DAP, Legality	.770	.753
2h: Time Management	.764	.754
2i: Transition Management	.743	.768
2f: Management	.734	.727
3f: Instruction, Assessment, Pacing	.720	.737
3c: Instruction	.719	.699
3a: Instructional planning	.707	.741
3b: Clear outcomes, Focuses student interest	.705	.733
2d: Roll model, Management	.704	.790
1c: Objectives	.704	.716
1d: PCK, Instructional planning	.699	.731
1b: Assessment	.697	.760
2c: Equitable practice, Least restrict. envmt.	.682	.681
1g: Time management	.680	.735
3e: Instruction, Promotes critical thinking	.669	.760
2j: Materials management	.648	.611
1e: Materials management, Technology	.639	.585
1a: Learning goals, DAP	.627	.701
4a: Assessment	.582	.712
2a: Value all learners, Positive support	.569	.569
3d: Instruction, Differentiation, Cult. competency	.560	.676
4d: Reflective practice	.530	.608
Factor II: Professional Dispositions	16.66% of Variance	19.9% of Variance
5a: Dependable	.840	.857
5b: Dependable	.810	.828
5c: Dress appropriately	.802	.787
5k: Professional drive	.769	.733
5j: Professional drive	.739	.716
5d: Follows school policies	.699	.686
5e: Knows organizational culture	.532	.566
5f: Collegiality, Interact with parent/community	.529	.586
Factor III: Student Support	17.56% of Variance	11.15% of Variance
5h: Advisory functions	.776	.678
5i: Interdisciplinary team player	.753	.687
5g: Community, Seeks student resources	.724	.583

Note: Maximum Likelihood factor analysis; Varimax rotation, Factors 1f, 2e, 2g, 2k, 4b and 4c removed (six factors that did not load the same for supervisor and CT data). Percent of Variance is across all 39 FSTSR items.

The items that loaded to the professional dispositions factor were identical for the supervisor and the CT. While supervisors and CTs had the same three items from section five in the enlisting and facilitating student support, an additional seven supervisor items loaded into that factor. Six items did not load in the identical factors for both the supervisor and CT data, leaving 33 items that grouped identically for both the supervisor and the CT data. Table 7 displays a factor order based on combined percentages. While the table indicates factors 1, 2, and 3 in the order they occurred for the CT data (38%, 20%, 11%, respectively), note that the third factor in the supervisor data had a greater percentage of the Variance than the second factor (32%, 17%, 18%, respectively).

Six items, seen in Table 8 did not load the same for the supervisor and the CT data. These items loaded to the student support factor in the supervisor data, and to the classroom teaching factor in the CT data.

Table 8
Six items that did not factor identically for supervisor and CT data

FSTSR Item	Factor loadings (factor name)	
	Supervisor	CT
1f: Lesson Planning, DAP, Differentiation	.597 (stud. support)	.697 (teaching)
2e: Applied knowledge of bio-ecology	.524 (stud support)	.679 (teaching)
2g: interactions, family, conflict resolution	.618 (stud support)	.521(teaching)
2k: coordinate support personnel	.583 (stud support)	.604 (teaching)
4b: Documentation for stakeholders	.666 (stud support)	.681 (teaching)
4c: Differentiation, referrals	.525 (stud support)	.680 (teaching)

Note: stud.support = Enlisting and facilitating student support; teaching = Classroom teaching

While these six items did not factor identically, the three factor solution is reinforced, as they do appear to have grouped into the same three factors as the other 33 items.

In the factor analysis of the supervisor data, nine items, displayed in Table 9, loaded to the factor identified as enlisting and facilitating student support. The factor name, enlisting and facilitating student support, was selected, as all nine items are related to the support a social contexts for learning. Three of these items also clustered as a factor in the analysis of the CT data.

Table 9
Items in the Full-Time Student Teaching Summary Report (Supervisor data) that grouped to the factor identified as "Enlisting and Facilitating Student Support"

1f. Design and adapt unit and lesson plans for all learners, including students with varying cultural, social, and linguistic backgrounds and for exceptional learners.
2e. Use knowledge of the influence of the physical, social and emotional climates of students' homes and the community to optimize motivation, learning, and behavior.
2g. Interact thoughtfully and courteously with all students and their families and seeks to resolve conflicts in a professional manner, respecting cultural contexts.
2k. Coordinate the use of instructional assistants and other support personnel to achieve instructional objectives, if these resources are available in the school setting.
4b. Document student progress in accomplishing state content standards and district standards, prepare data summaries that show this progress to others, and inform students, supervisors, and parents about the learning process.
4c. Refine plans for instruction, establish alternative goals or environments, or make referrals when appropriate.
5g. Collaborate with parents, colleagues, and members of the community to provide internal and external assistance to students and their families, if needed to promote student learning.
5h. Perform advisory functions for students in formal and informal settings.
5i. Function as a member of an interdisciplinary team to achieve long-term goals

Note: The final three Items (5g, 5h, and 5i) similarly grouped to an internal factor in the CT data.

As a follow-up to the three factor analysis, a four factor solution was also conducted for both the supervisor and the CT data. In the four factor analysis, none of the 39 items loaded beyond the three factors suggested by the preliminary principle components analysis. The single factor hypothesis was not supported, as the outcome of the factor analysis suggests that the 39 FSTSR items statistically cluster around three factors. Twenty-two of the items (56%) on the FSTSR clustered around the first factor which was designated "classroom teaching".

Conclusion

In summary, chapter four reported findings regarding how accurately a measure of overall student teacher proficiency can be predicted from a combination of measures of student teacher performance on the FSTSR that include indications of a developmentally informed perspective? The 462 candidates assessed on the FSTSR documents explored in this study were from a variety of authorization levels and content areas and completed full-time student teaching during one of three academic years: 05/06, 06/07, or 07/08. The Student Teacher Proficiency Index, created from FSTSR scores for this study, approximates a normal distribution. The reliability of the 39

FSTSR items were explored using a Cronbach's alpha, which indicated that the scores from the measure are reliable, and may be suitable for further analysis. Multiple regression analysis indicated that selected development related measures of student performance, when taken together, predict 92% of the score of overall student teaching performance. It was noted, however, that the simultaneous reduction of partial coefficients indicate a problem of multicollinearity, which led to a secondary hypothesis that there is a single, central factor that underlies the 39 items on the Full-Time Student Teaching Summary Report. A maximum likelihood factor analysis, using a Varimax rotation, was conducted to explore the dimensionality of the FSTSR. It was found that the 39 FSTSR items cluster to three factors, thus the single factor hypothesis was incorrect. Over half of the FSTSR items of diverse constructs did clustered to one factor, identified as classroom teaching.

Chapter Five: Discussion

In chapter five, a review of the aims of this investigation and the process used to accomplish those aims will precede a discussion of the findings in light of the theoretical and research literature. Next will be discourse on the implications of this study. The conclusion will include the identification of limitations and ideas for further research.

Review of Research Aims

National voices that have been critical of the effectiveness of teacher education at helping candidates to apply theory to practice, major efforts by national policy makers to respond to that criticism, and a commitment to inform continuous improvement efforts in local teacher education, all led to this investigation. This study is of available data that is intended to indicate the quality of candidate knowledge, skills, and dispositions as demonstrated during the full-time student teaching experience. The teacher preparation program at one private comprehensive university in the northwest uses a measure to assess student teacher proficiency called the Full-Time Student Teaching Summary Report (FSTSR). This investigation was a secondary analysis of existing data from all of the FSTSR assessments that were completed on the candidates who successfully completed full-time student teaching in 05/06, 06/07, and 07/08. This research was a secondary analysis of data from approximately 460 of these assessment documents. While all of the ratings on the FSTSR were used in this study, and external analysis indicated that several of the items on the instrument (items 1a through 1g, and item 2b) form a group measure of student teacher proficiency that includes indications of developmentally informed practice. One of the competencies the instrument seeks to measure is how teacher candidates are doing at applying developmental theory to their practice. The main focus of this study has been the relationship between applied knowledge of development in the classroom and overall quality of student

teaching.

The FSTSR instrument does not include an overall summary score. For the purpose of this study, a simple summary score indicating overall student teacher proficiency, the student teacher proficiency index (STPI), was created for each unit of study. This is a simple sum of the 39 ratings (0-to-6 scale) completed on each FSTSR, by both the university supervisor and the cooperating teacher. The maximum possible STPI score is 468. The STPI scores are the dependent, or criterion variables in this study.

The purpose of this study was to explore student teaching data on pre-service teachers from one northwest private comprehensive university. This study was a secondary analysis on ratings of the proficiency demonstrated by a population of approximately 460 student teachers who completed their full-time student teaching experience between the spring of 2005 and the fall of 2008. The primary focus of this study was to explore how items on the FSTSR that include the assessment of practice that is appropriate to students level of development, may or may not predict a global measure of student teacher proficiency. The objective was to gain insight into how the proficiency of teacher candidates' application of knowledge of child development to teaching and learning may be related to the overall success of their full-time student teaching.

Review of Method

Data was collected from the 462 Full-Time Student Teaching Summary reports used to assess the population of student teachers at one private comprehensive university in the northwest that completed student teaching during one of three academic years (05/06, 06/07, 07/08). The data was loaded into SPSS and an index of overall student teacher quality was created by summing the 78 scores recorded on each measure by both a university supervisor and cooperating teacher (39 scores each). Following an investigation of the descriptives collected, a secondary analysis of the

data from FSTSR documents began by conducting an internal consistency estimate of reliability, the coefficient alpha, which was computed for each of the five sections on the FSTSR. The data was found suitable for further analysis, thus, a multiple regression analysis procedure was conducted to evaluate how well the predictor variables; sixteen indicators of applied developmental knowledge on the FSTSR, predicted the criterion variable; overall student teacher proficiency (STPI). A causal hypothesis of the problem of multicollinearity in the resulting data was that the FSTSR has a single central property, and following an external exploration of the primary constructs present in the 39 FSTSR items, a maximum likelihood factor analysis procedure, using a Varimax rotation, was conducted to explore the internal dimensionality of the 39 items on the FSTSR.

Discussion of Findings

The 462 candidates who were assessed by the measure investigated in this study all completed student teaching. This may explain why few low scores of one or zero are found on the FSTSR documents studied. Very few of the measures available assessed candidates who did not complete student teaching, as most of these candidates would never have reached their final assessment. The range of the STPI scores of overall student teaching quality was 250, and they approximate a normal distribution (*kurtosis* = .18) with small negative skew (*skew* = -.54). The bottom seven outliers in the STPI scores indicate that a few students completed student teaching without demonstrating student teacher quality on the FSTSR. The lowest of these (218 and 239) is an average item score of less than three (218/78=2.79, 232/78=2.97). In these two cases, successful student teaching was, perhaps, the result of other indicators. The abrupt spike of scores at the upper end of the index may indicate that 10 (2.2%) of the 462 candidates, who seem to have been scored as “perfect student teachers” may not have been informed on their FSTSR of those aspects of there

student teaching that demonstrated their particular strengths.

Reliability. It was established in chapter four that the values for coefficient alpha in each of the five sections of the FSTSR (α = .96, .97, .96, .93, and .96) demonstrate that the measure is statistically reliable and suitable for further analysis. The indication here is that the instrument has successfully measured aspects of student teacher quality in similar ways over time. A reliable measure can be useful, not only for candidate evaluation, but also for the collection of data to be analyzed with findings used in programs of continuous improvement. A caution here, as noted in the limitations below, is that instruments that share a common response scale and have items that are similarly worded may be less reliable than indicated by the internal consistency. One way to strengthen confidence in the reliability of future versions of the instrument may be to vary the scale in the instrument or re-word some of the items that are similar in their wording.

One of the reasons that more recent data from the FSTSR was not investigated in this study is that the teacher education program that provided the documents for this study recently changed from paper documents to an on-line version of the assessment measure. One aspect of making this change was to review the wording on the FSTSR items. It is not yet known how an online instrument will impact the data, however, one result of this change is expected to be that the data is more readily available for continued research on the FSTSR data. This study provides a baseline for the future study of the more recent data from the FSTSR, and allows for the investigation into how these modifications may impact the nature and value of the data being collected.

Multiple regression analysis. The main objective of this study was to determine how accurately a measure of overall student teacher proficiency, the student teacher proficiency index, can be predicted from seven items on the FSTSR that include the assessment of applied knowledge of development. A multiple regression analysis procedure was conducted to evaluate how well

these 14 variables (seven supervisor scores & seven CT scores), predicted the criterion variable: overall student teacher proficiency (STPI). It was found that these selected measures of student performance, when taken together, significantly predict 92% of the score of overall student teaching performance. This finding indicates that if supervisors and cooperating teachers had only assessed candidates on these seven items, that 92% of the time, it would have resulted in the same overall assessment of student teaching success.

The measurement of constructs in all of the 39 items, however, is important, both to provide information about strengths and weaknesses to all stakeholders, and also to demonstrate the meeting of the professional standards with which the individual items are aligned. Additionally, while all of the bivariate correlations between the items associated with development and the STPI scores were both positive and large, after controlling for all other predictors, only ten of the sixteen partial correlations were found to be significant ($p < .05$) and all of them became small correlations. This simultaneous drop from large bivariate correlations to small partial correlations indicates a problem of multicollinearity. Cohen, Cohen, West, and Aiken (2003) assert that multicollinearity should be addressed, as results of the multiple regression where it is present will "necessarily be misleading"(p. 98).

A possible cause of multicollinearity is that evaluators using the FSTSR measure tend to score all 39 of the items as high or low because they perceive a single overriding concept to be high or low. Examples of such an overriding concept might include behavior management, professionalism, organizational ability, or perhaps some shared concept of teacher quality. The result of there being only one central property that is equally influencing the assessment of all 39 items on the FSTSR, would be that any seven items, not just the measures related to development, would predict the STPI score in the same way. Another result is that the individual items would

not be providing much meaningful data around the individual external constructs that seem to be apparent in the wording of each item, but rather, they each would be measuring, for the most part, the single central property of the instrument. Therefore, as a result of these findings, a hypothesis was formed that the FSTSR has a single central property, which led to the multicollinearity of the predictor variables. The follow-up hypothesis was explored by conducting a factor analysis.

Factor analysis. Factor analysis helps to reveal the underlying structure of an instrument. As a preliminary step, an external analysis of constructs that are present in the wording of the 39 items was conducted. Particularly when the leading introduction in each section of the items is included in the analysis, several of the items on the instrument form a group of measures of student teacher proficiency that include indications of developmentally informed practice. The external analysis also revealed, however, that most of these items include multiple constructs, and it would be difficult to say for certain, which of the constructs in each item was assessed by the evaluators. While at first glance, the results of the multiple regression analysis appear to indicate that the construct of developmentally informed practice may be significantly related to overall student teaching quality, this conclusion is not necessarily supported by the findings. Because of the multiple constructs that are found in most of the seven predictor variables, there is nothing that indicates for certain that it is developmental appropriateness that is being assessed by the evaluators.

The maximum likelihood factor analysis procedure was then conducted to explore the dimensionality of the 39 items on the FSTSR. The procedure was applied first to the items as they were completed by university supervisors, and then again on the items as cooperating teachers assessed them. Three separate notions provided the basis for selecting the number of factors to rotate during the factor analysis procedure. First, the multicollinearity of the predictor variables,

discovered during the multiple regression analysis, led to a secondary hypothesis that there is a single, central factor that underlies the 39 items on the Full-Time Student Teaching Summary Report. Second, an initial principle component analysis resulted in scree plots for both the university supervisor data and the cooperating teacher data. These suggest that the hypothesis of a single, central factor may be incorrect; two additional factors are indicated as probable. Third, as factor solutions were interpreted, the procedure led to similar conclusions for the data collected from supervisors and the data collected from cooperating teachers. Thirty-three of the thirty-nine items clustered to three factors in a nearly identical way, thus the two sets of data reinforced a three factor solution.

The name given to each of the three factors was an abstract that was supported by all of the clustered items. A *classroom teaching* factor accounted for 31.6% of the item variance in the supervisor data, and 37.8% of the item variance in the CT data. This factor was named "classroom teaching" because of the diverse external constructs that grouped, including classroom management, instruction, assessment, goals and objectives, pacing, planning, differentiation, developmentally appropriate practice, and management of time, materials, and transitions, among others. All of these constructs related to the general abstract concept of classroom teaching.

A professional dispositions factor accounted for 16.6% of the variance in the supervisor data, and 19.9% of the item variance in the CT data. A factor identified as enlisting and facilitating student support accounted for 17.6% of the variance of the supervisor data, and 11.2% of the variance of the CT data. The finding that, out of the 39 items of the FSTSR, 33 items grouped into the same factors for both the supervisor and the CT data, provides strong support for three internal properties. The single factor hypothesis was not supported, as the outcome of the factor analysis suggests that the 39 FSTSR items statistically cluster around three factors. Twenty-two of the

items (56%) on the FSTSR, however, did cluster around the first factor designated as "classroom teaching". This finding supports the idea that more than half of the items on the FSTSR are measuring, for the most part, a central property identified as classroom teaching.

The factorial analysis did not support the external construct analysis. While it is true that the development construct is in each of the seven items used as predictor variables, it may not be true that they are understood to represent a unified construct by evaluators. While the single factor hypothesis was not supported, the outcome of the factor analysis suggests that the origin of the multicollinearity in the FSTSR data is likely that the thirty-nine items statistically cluster around only three factors. The items used in this study to assess the application of developmental knowledge in the classroom (items 1a through 1g, and item 2b) did not factor out as a separate construct, but rather, except for item 1f in the supervisor data, all fall into the broader "classroom teaching" factor. The finding that the eight development related items account for 92% of the variance in the STPI may be misleading, as the factor analysis indicates that most of sections one through four of the FSTSR are measuring the identical internal construct; classroom teaching.

Kachigan (1991) reveals what may be another limitation: "Related to the collinearity problem is the situation in which we include a predictor variable that is really not a predictor variable as such but rather a slight variation of the criterion variable" (p. 189). The classroom teaching factor appears to be quite similar to the criterion variable of overall student teaching quality. In this case, there are a large number of variables that load into the classroom teaching factor, and one wonders why "professional dispositions" and "enlisting and facilitating student support" are not also gathered into the group. One possibility is that the student support factor groups items which often reach beyond the walls of the classroom to outside resources, such as parents and community. It is also a possibility that evaluators tend to view capable classroom

competence as a separate issue from professional dispositions. Perhaps they believe that one can be a professional without being a skilled instructor, and visa versa. In any case, the similarity between the classroom teaching factor and the student teacher quality criterion is further support for viewing the findings of the multiple regression analysis as possibly misleading.

Teacher educators, candidates, and other stakeholders would likely benefit from assessment measures that indicate the relative strength or weakness of each of the 43 external constructs identified on the FSTSR. This instrument appears to have potential for improvement, in that, steps could be taken to provide more meaningful data. Findings indicate that all but three of the items in section five of the FSTSR, professional behaviors, strongly correlate to an internal factor identified as professional dispositions. It may be possible that items could be arranged in other sections on the instrument so that they would also group around other internal factors, thus, modifying the instrument so that internal factors more closely matched the external constructs. Another step, one that has already begun to be addressed by those who helped to modify the instrument for online use, is to make it so that fewer of the items are convoluted by multiple constructs. One theory that surfaces as the result of these findings is that the practice of creating measurement instruments with items formed directly from the wording of state or national standards may lead to less meaningful assessments, as the language of standards may not be organized in a way that supports clear singular constructs that group around internal factors. It may be that if the standards were first analyzed, externally and internally, for the constructs and factors, and measures were then created from the findings, a more meaningful instrument would result.

Findings from the factor analysis are that the problem of multicollinearity results from a large number of items that cluster to one internal factor. The report of predictability of a developmental dimension to overall student teacher proficiency, may be misleading, as the group

items used to assess a developmental dimension were not found to be a distinct factor in the measure, but rather, load onto the more general factor of classroom teaching.

Findings in Light of the Theoretical and Research Literature

One of the more interesting findings in this study is that one of the three factors that emerged in the factor analysis was "enlisting and facilitating student support". This suggests that one of the primary constructs that both supervisors (nine items) and cooperating teachers (three items) recognize as a distinct element of successful student teaching is the ability to support a social context for learning. In assigning a name to a factor, the researcher seeks an abstract concept to which all of the items that have clustered can be associated. The nine items, displayed in Table 10, are related to the social learning theories of Vygotsky (1934), Bronfenbrenner (2001), and Bruner (1996). Vygotsky represents the idea of *apprenticeship*, or the zone of proximal development. Bronfenbrenner represents the idea of *Bioecology*. In order to make decisions that are in the best interests of the developing student, the teacher may benefit from an understanding of the outward ecological influences on the student. Bruner represents the idea of building a temporary *scaffold* that provides support for the learner in a social context. Rather than waiting for the student to be ready for learning content, you use social resources to enable the child to learning today. The social support of learning can be clearly seen throughout the factor, and it is interesting that supervisors and cooperating teachers may recognize this as a factor of successful teaching, even before they recognize distinct factors such as classroom management or differentiation.

The findings that these constructs are seen as distinct from the items that seem to cluster around classroom teaching, may indicate what some have called a developmentally informed perspective, in which it is recognized that good teachers ought not focus only on the academic goals of schooling, but should also be interested in "a developmentally informed view of children

and their developmental needs" (Rimm-Kaufman, et al., 2009, p. 970).

Table 10
Items in the FSTSR that grouped to the factor identified as "Enlist and Facilitate Student Support" and their connection to social learning theory.

Enlist and Facilitate Student Support Factor	Social Learning Theory
1f. Design and adapt unit and lesson plans for all learners, including students with varying cultural, social, and linguistic backgrounds and for exceptional learners.	Make teaching decisions based on the outward ecological influences on the student-Bronfenbrenner
2e. Use knowledge of the influence of the physical, social and emotional climates of students' homes and the community to optimize motivation, learning, and behavior.	Make teaching decisions based on the outward ecological influences on the student-Bronfenbrenner
2g. Interact thoughtfully and courteously with all students and their families and seeks to resolve conflicts in a professional manner, respecting cultural contexts.	Work to shape the Bioecology of the student to support learning- Bronfenbrenner
2k. Coordinate the use of instructional assistants and other support personnel to achieve instructional objectives, if these resources are available in the school setting.	Build temporary scaffolds which provides support for the learner in a social context- Bruner
4b. Document student progress in accomplishing state content standards and district standards, prepare data summaries that show this progress to others, and inform students, supervisors, and parents about the learning process.	Clearly understand what student are able to do so that learning, in a social context, can happen within the zone of proximal development- Vygotsky
4c. Refine plans for instruction, establish alternative goals or environments, or make referrals when appropriate.	Build temporary scaffolds which provides support for the learner in a social context- Bruner
5g. Collaborate with parents, colleagues, and members of the community to provide internal and external assistance to students and their families, if needed to promote student learning.	Make teaching decisions based on the outward ecological influences on the student-Bronfenbrenner & Build a temporary scaffold which provides support for the learner in a social context- Bruner
5h. Perform advisory functions for students in formal and informal settings.	Apprenticeship- Bronfenbrenner
5i. Function as a member of an interdisciplinary team to achieve long-term goals	Work to shape the Bioecology of the student to support learning- Bronfenbrenner

Note: Only items 5g, 5h, and 5i clustered to this factor in the cooperating teacher data.

While most of these items seem to clearly include elements of social learning theory, an alternative conclusion to the clustering of the items is that the support of social learning is a particularly difficult task for student teachers to accomplish, for various reasons. It may be that the reason these items have grouped is because supervisors and CTs recognize them as aspects of

student teaching that are particularly challenging. Both conclusions are interesting, and may provide impetus for further investigation.

Implications of the Study

Few studies have been done that explore the application of knowledge of development in teacher education. This dissertation contributes to the research literature in that it investigates that assessment of applied knowledge of development, such as developmentally appropriate practice, by candidates who are engaged in clinical practice. This study provides an example of supervisors and cooperating teachers who, using a reliable tool, are clearly differentiating student teacher success across a continuum of quality. The findings of this study support the theory that some evaluators of clinical practice may have a strong, shared concept of classroom teaching that tends to influence the evaluation of more specific and distinct concepts of teaching. The findings of this study supports a theory that the practice of creating measurement instruments with items formed directly from the wording of state or national standards may lead to less meaningful assessments, as the language of standards may not be organized in a way that supports clear singular constructs that group around internal factors. Finally, findings of this study supports the theory that some supervisors and cooperating teachers may recognize the social support of student learning as a factor of successful teaching, even more powerfully than they recognize some distinct classroom teaching constructs such as classroom management or differentiation.

Limitations of the Research

This investigation was a secondary analysis of data from the School of Education at one private comprehensive university in the northwest. While this local study may be useful for continuous improvement at the local level and for the development of theory, none of the findings are considered to be generalizable to other populations. This is all the more so, as demographic

data on the FSTSR was limited to candidate authorizations and content areas, and there is little bases for generalizing to similar populations. It is important to note that this was a secondary analysis of data, and the original intent of each Full-Time Student Teaching Summary Report was to provide evidence of the student teaching competency of an individual student teacher. While this researcher asserts that the data from Full-Time Student Teaching Summary Reports may be useful for gathering information for continuous improvement, it is recognized that this may go beyond the original intent of the tool, and that the data is being used in a new manner. This study extended the use of the FSTSR beyond its original intent.

While efforts were made to be as accurate as possible in the collection of data, it is likely that at least of few of the over 36,000 scores were miss-entered into SPSS. The decision was made to make all missing scores in the data into the score of three, for reasons earlier noted. The result of this decision will likely be to move the mean of the data somewhat toward the middle of the scale. Other choices would likely have resulted in slightly different results. Had a careful record of missing data been kept, it would have been possible to compare various solutions to this issue.

A possible limitation to our confidence in the reliability of the data is the opportunity for the unrelated-errors assumption to be violated. In order for an internal consistency estimate to accurately reflect the reliability of the data, the items on the measure should not be linked. Green and Salkind (2008) report that the unrelated-errors assumption "is more likely to be violated if items are syntactically similar and share a common response scale" (p. 327). The FSTSR items share a common response scale, and some items are similarly worded and phrased. While it is difficult to determine, it is possible that the instrument is less reliable than indicated by the internal consistency estimate. Additionally, it is probable that many, if not most, of the supervisors and cooperating teachers conferred as to their evaluation on the FSTSR, contributing to the similarity

in the factor analysis and to the consistency between scores.

The findings from the multiple regression procedure suggest problems of multicollinearity. According to Cohen, Cohen, West, and Aiken (2003) ignoring this problem will result in findings that "will necessarily be misleading" (p. 98). While the results of the multiple regression procedure were reported as significant, and are not necessarily incorrect, it is possible that because of the problem of multicollinearity, and also due to a lack of validity caused by the multiple constructs in the predictor items, the development related constructs within the items were not all recognized and assessed by the evaluators. The factor analysis suggests that these items do not hold together as a unified group of constructs in the underlying structure of the instrument. While there is some confidence that the predictor variables do significantly predict the criterion, there is far less confidence that those variable represent a unified construct of developmentally informed practice.

As noted above, naming factors has been called more of an art than a science, and there is a good deal of subjective researcher judgment that went into the identification of both external constructs and naming of internal factors. Alternative conclusions were possible, for example, while one of the factor names selected by the researcher was "enlisting and facilitating student support", another possibility may have been, "items that tend to be difficult for student teachers to demonstrate during their clinical practice." While more confidence in factor names may be gained through further research, the personal judgment required leaves considerable room for researcher error, or for the reader to simply disagree with the conclusions. As findings are considered, these major limitations must be taken into account.

Ideas for Further Study

This study was an investigation of data from the Full-Time Student Teaching Summary Reports used between the fall of 2005 and the spring of 2008 by one northwest school of

education. A follow-up investigation of more recent data from the FSTSR, particularly data in the modified on-line version of the instrument, should be done in order to both confirm or reject findings from this study, and to continue to gather information that may contribute to continuous improvement of local teacher education efforts and to the improvement of student teacher assessment. Suggestions in this study, along with a follow-up analysis of the more recent FSTSR data, may result in further modification of the FSTSR instrument to improve construct validity, while remaining aligned to state and national standards. This should be followed by a careful look at the data produced by the revised instrument to again investigate reliability and the internal factorial structure. Exploration into other measures of teacher quality that have been found to be valid and reliable assessments, such at the CLASS instrument (Pianta, et al., 2007; Pianta & Hamre, 2009a, 2009b), may also be desirable.

Few studies are available on the assessment of student teaching. It has been proposed that there may be a strong, shared concept of classroom teaching among clinical practice evaluators that may tend to trump more specific and distinct concepts of teaching. As this could have an impact on the quality of student teaching, this theory should be further investigated.

It has also been theorized that the practice of creating measurement instruments from state and national standards may lead to less meaningful instruments. An investigation into the validity, reliability, and internal factors of such instruments, particularly when compared to instruments that were formed with less immediate adaptation of standards language may shed light on this theory. Additionally, the development of an instrument that is derived from the external and internal factor analysis of standards, and the investigation of the reliability and underlying structure of that instrument may be worthwhile.

Findings from this study also resulted in the theory that some teacher educators and

classroom teachers recognize the social support of student learning as a major classroom teaching construct, perhaps even more powerfully than other constructs such as motivation or differentiation. Further investigation should be done into the perceived importance of the teacher's role in promoting the social support of student learning, including studies of what educators are doing to promote social learning, and how such practices impacts the academic success of all learners. A related investigation into causal hypotheses for the reason that items related to the support of social learning tended to group together in a factor analysis may also be beneficial.

Finally, continued studies are needed on the impact of developmentally informed practice on the cognitive, social, physical, and emotional success of all students. Such studies are particularly scarce at the secondary level. Additionally, further work needs to be done to clarify the specific teacher knowledge, skills, and dispositions that support the healthy development of all children that can be facilitated in the development of emergent teachers and that can be assessed in clinical practice.

It is critical that teacher educators continue to improve the assessment of the clinical experience, particularly in an era when national voices have questioned the effectiveness of teacher education and found deficient connections between theory and practice. This study has been a local response to a national concern. Research is one key to the continuous improvement of teacher education, as we work together to support classrooms where both time-tested and emerging theory has a meaningful impact on the successful development of all students.

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Appendix A

Figure A1 FSTSR 2005/2006 p.1

1st AUTHORIZATION
FULL-TIME STUDENT TEACHING SUMMARY REPORT

Name of Student: _____ Semester/Year: Spring 2005
Subject: _____ Grade: K Date of Evaluation: 4-18-05
Cooperating Teacher: _____
School: _____ District: _____

The following standards are set by Teachers Standards and Practices Commission (TSPC) requiring student teachers to demonstrate the knowledge, skills, and competencies necessary for earning an Initial Teaching License at the following authorization level (check appropriate level):

Early Childhood ✓ Elementary ✓ Middle Level _____ High School _____

Directions:
This evaluation form will provide summary feedback to the student teacher and [redacted] University faculty members. The following standards are set by Teachers Standards and Practices Commission (TSPC) requiring student teachers to demonstrate the knowledge, skills, and competencies necessary for good teaching and learning.

Consider the characteristics for each of the five standard areas and determine the level of proficiency demonstrated by the student teacher at the conclusion of the student teaching experience. Student teachers should be able to demonstrate proficiency at a **level 3 or 4** for each of the knowledge, skills, and competencies in order to earn the Initial Teaching License. **The [redacted] Supervisor and the Cooperating Teacher both need to determine that each of the standards has been met in order for the student teacher to be eligible for the Initial Teaching License.**

Rating Scale for Standard One:

0	1 – 2	3 – 4	5 - 6
Not yet able to demonstrate the knowledge, **skills**, and competencies needed to meet the needs of **many** learners. **(Questionable whether the candidate has the potential to meet standard one** for the **Initial** Teaching License during this practicum.)	**Developing an awareness** & beginning to demonstrate the knowledge, skills, and competencies needed to meet the needs of **most** learners. (Has the **potential to meet standard one** for the Initial Teaching License.)	**Knows and demonstrates** the methods, skills, and strategies needed to meet the needs of **most** learners. (Regularly **meets standard one** for the Initial Teaching License.)	**Knows and demonstrates well** the methods, skills, and strategies needed to meet the needs of **most** diverse learners. **(Exceeds standard one** for the Initial Teaching License.)

PLAN FOR INSTRUCTION 1. **Candidates plan instruction that supports student progress in learning and is appropriate for the developmental level and demonstrate they are able to:**	GF University Supervisor Has Met ✓ Not Met _____	Cooperating Teacher Has Met _____ Not Met _____
a. Select or write learning goals for units of instruction that are consistent with the school's long term curriculum goals, state and district standards, research findings on how students learn, and the physical and mental maturity of one's students.	0 1 2 3 (4) 5 6	0 1 2 3 4 (5) 6
b. Determine the current performance level of one's students with respect to the learning goals established for a unit of instruction.	0 1 2 3 (4) 5 6	0 1 2 3 4 (5) 6
c. Establish objectives within the unit of instruction that will be useful in formulating daily lessons and in evaluating the progress of students toward attainment of unit goals.	0 1 2 3 (4) 5 6	0 1 2 3 4 (5) 6
d. Determine content, skills and processes that will assist students in accomplishing desired unit outcomes, and design learning activities that lead to their mastery	0 1 2 3 (4) 5 6	0 1 2 3 4 (5) 6
e. Select and organize instructional materials and equipment and technologies needed to teach the unit of instruction.	0 1 2 3 4 (5) 6	0 1 2 3 4 (5) 6
f. Adapt unit and lesson plans for exceptional learners and for students with varying cultural, social and linguistic backgrounds.	0 1 2 3 (4) 5 6	0 1 2 3 4 (5) 6
g. Estimate the time required within a unit for teacher-instruction, student-managed learning and directed practice, student evaluation/reporting, and re-teaching/problem solving.	0 1 2 3 (4) 5 6	0 1 2 3 4 (5) 6

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Rating Scale for Standard Two:		Student Teacher:	
0	1 - 2	3 - 4	5 - 6
Not yet able to demonstrate the knowledge, skills, and competencies needed to meet the needs of **many** learners. **(Questionable whether the candidate has the potential to meet standard two** for the Initial Teaching License during this practicum.)	**Developing an awareness** & beginning to demonstrate the knowledge, skills, and competencies needed to meet the needs of **most** learners. (Has the **potential to meet standard two** for the Initial Teaching License.)	**Knows and demonstrates** the methods, skills, and strategies needed to meet the needs of **most** learners. (Regularly **meets standard two** for the Initial Teaching License.)	**Knows and demonstrates well** the methods, skills, and strategies needed to meet the needs of **most** diverse learners. (**Exceeds standard two** for the Initial Teaching License.)

ESTABLISH CLASSROOM CLIMATE 2. **Candidates establish a classroom climate conducive to learning and demonstrate they are able to:**	GF University Supervisor Has Met ____ Not Met ____	Cooperating Teacher Has Met ____ Not Met ____
a. Affirm the dignity and worth of all students and provide the positive support students need to become effective learners.	0 1 2 3 4 (5) 6	0 1 2 3 4 5 (6)
b. Communicate classroom rules and behavioral expectations that provide a safe and orderly environment for learning, are appropriate to the level of development of students, and are consistent with laws governing student rights and responsibilities.	0 1 2 3 4 (5) 6	0 1 2 3 4 (5) 6
c. Establish classroom rules and procedures, applying to all students' principles of the least restrictive environment for a student with disabilities.	0 1 2 3 (4) 5 6	0 1 2 3 4 5 (6)
d. Establish and maintain classroom rules and procedures, model appropriate social behavior, and provide meaningful reinforcement when it occurs	0 1 2 3 (4) 5 6	0 1 2 3 4 5 (6)
e. Take into account the influence of the physical, social and emotional climates of students' homes and the community on motivation and behavior when establishing classroom rules and procedures.	0 1 2 3 4 5 (6)	0 1 2 3 4 5 (6)
f. Monitor student conduct, and take appropriate action when misbehavior occurs.	0 1 2 3 (4) 5 6	0 1 2 3 4 (5) 6
g. Interact thoughtfully and courteously with students and their parents about all of the above, and resolve conflicts in a professional manner, respecting the cultural context of the community.	0 1 2 3 4 (5) 6	0 1 2 3 4 5 (6)
h. Use classroom time effectively to provide maximum time for learning.	0 1 2 3 (4) 5 6	0 1 2 3 4 (5) 6
i. Manage instructional transitions decisively and without loss of instructional time.	0 1 2 3 (4) 5 6	0 1 2 3 4 (5) 6
j. Arrange and set up instructional materials and equipment in advance of class to facilitate their effective and efficient use during lessons.	0 1 2 3 4 (5) 6	0 1 2 3 (4) 5 6
k. Coordinate the use of instructional assistants and other support personnel to achieve instructional objectives, if these resources are available in the school setting.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6

Figure A1 FSTSR 2005/2006 p.3

Rating Scale for Standard Three: Student Teacher:

0	1 – 2	3 – 4	5 - 6
Not yet able to demonstrate the knowledge, skills, and competencies needed to meet the needs of **many** learners. **(Questionable whether the candidate has the potential to meet standard three** for the Initial Teaching License during this practicum.)	**Developing an awareness** & beginning to demonstrate the knowledge, skills, and competencies needed to meet the needs of **most** learners. (Has the **potential to meet standard three** for the Initial Teaching License.)	**Knows and demonstrates** the methods, skills, and strategies needed to meet the needs of **most** learners. (Regularly **meets standard three** for the Initial Teaching License.)	**Knows and demonstrates well** the methods, skills, and strategies needed to meet the needs of **most** diverse learners. **(Exceeds standard three** for the Initial Teaching License.)

STANDARDS BASED TEACHING **3. Candidates engage students in planned learning activities and demonstrate they are able to:**	GF University Supervisor Has Met _____ Not Met _____	Cooperating Teacher Has Met _____ Not Met _____
a. Choose organizational structures appropriate for the objectives of instruction.	0 1 2 3 (4) 5 6	0 1 2 3 4 (5) 6
b. Communicate learning outcomes to be achieved and focus student interest on tasks to be accomplished	0 1 2 3 4 (5) 6	0 1 2 3 4 (5) 6
c. Implement instructional plans that employ knowledge of subject matter and basic skills.	0 1 2 3 4 (5) 6	0 1 2 3 4 (5) 6
d. Use a variety of research-based educational practices that reflect how students learn, are sensitive to individual differences and diverse cultures, and encourage parent participation.	0 1 2 3 4 (5) 6	0 1 2 3 4 (5) 6
e. Emphasize instructional techniques that promote critical thinking and problem solving, and that encourage divergent as well as convergent thinking.	0 1 2 3 (4) 5 6	0 1 2 3 4 (5) 6
f. Monitor the engagement of students in learning activities, and the progress they are making, to determine if the pace or content of instruction needs to be modified to assure that all students accomplish lesson and unit objectives.	0 1 2 3 (4) 5 6	0 1 2 3 4 (5) 6

Rating Scale for Standard Four:

0	1 – 2	3 – 4	5 - 6
Not yet able to demonstrate the knowledge, skills, and competencies needed to meet the needs of **many** learners. **(Questionable whether the candidate has the potential to meet standard four** for the Initial Teaching License during this practicum.)	**Developing an awareness** & beginning to demonstrate the knowledge, skills, and competencies needed to meet the needs of **most** learners. (Has the **potential to meet standard four** for the Initial Teaching License.)	**Knows and demonstrates** the methods, skills, and strategies needed to meet the needs of **most** learners. (Regularly **meets standard four** for the Initial Teaching License.)	**Knows and demonstrates well** the methods, skills, and strategies needed to meet the needs of **most** diverse learners. **(Exceeds standard four** for the Initial Teaching License.)

ASSESSMENT **4. Candidates evaluate, act upon, and report student progress in learning, and demonstrate they are able to:**	GF University Supervisor Has Met _____ Not Met _____	Cooperating Teacher Has Met _____ Not Met _____
a. Select and/or develop tests, performance measures, observation schedules, student interviews, or other formal or informal assessment procedures that are valid and reliable to determine the progress of all students including those from diverse cultural or ethnic backgrounds.	0 1 2 3 (4) 5 6	0 1 2 3 4 (5) 6
b. Document student progress in accomplishing state content standards and district standards, prepare data summaries that show this progress to others, and inform students, supervisors, and parents about the learning process.	0 1 2 3 (4) 5 6	0 1 2 3 4 (5) 6
c. Refine plans for instruction, establish alternative goals or environments, or make referrals when appropriate.	0 1 2 3 4 (5) 6	0 1 2 3 4 (5) 6
d. Collaborate with parents, colleagues and members of the community to provide internal and external assistance to students and their families, if needed to promote student learning.	0 1 2 3 4 5 6 N/A	0 1 2 3 4 5 6 N/A
e. Assemble, reflect upon, interpret and communicate evidence of one's own effectiveness as a teacher, including evidence of success in fostering student progress in learning, and evidence of effectiveness in planning further intervention.	0 1 2 3 4 (5) 6	0 1 2 3 4 (5) 6

Figure A1 FSTSR 2005/2006 p.4

Rating Scale for Standard Five: Student Teacher:

0	1 – 2	3 – 4	5 - 6
Not yet able to demonstrate professional behaviors, ethics, and values required of a licensed educator. **(Questionable whether the candidate has the potential to meet the standards** for the Initial Teaching License during this practicum.)	**Developing an awareness** & beginning to demonstrate professional behaviors, ethics, and values required of a licensed educator. (Has the **potential to meet standard five** for the Initial Teaching License.)	**Knows and demonstrates** on a regular basis the professional behaviors, ethics, and values required of a licensed educator. (Regularly **meets standard five** for the Initial Teaching License.)	**Knows and demonstrates well** professional behaviors, ethics, and values required of a licensed educator. (**Exceeds standard five** for the Initial Teaching License .)

PROFESSIONAL BEHAVIOR 5. Candidates exhibit professional behaviors, ethics and values and demonstrate they are able to:	GF University Supervisor Has Met ____ Not Met ____	Cooperating Teacher Has Met ____ Not Met ____
a. Be dependable.	0 1 2 3 4 5 (6)	0 1 2 3 4 5 (6)
b. Meet work schedule demands.	0 1 2 3 4 5 (6)	0 1 2 3 4 5 (6)
c. Dress appropriately.	0 1 2 3 4 5 (6)	0 1 2 3 4 5 (6)
d. Be aware of and act in accordance with school policies and practices.	0 1 2 3 4 5 (6)	0 1 2 3 4 5 (6)
e. Respect cultural patterns and expectations that operate within a school.	0 1 2 3 4 5 (6)	0 1 2 3 4 5 (6)
f. Interact constructively with colleagues, administrators, supervisors and educational assistants and parents.	0 1 2 3 4 5 (6)	0 1 2 3 4 5 (6)
g. Perform advisory functions for students in formal and informal settings.	0 1 2 3 4 5 6 N/A	0 1 2 3 4 5 6 N/A
h. Function as a member of an interdisciplinary team to achieve long-term goals.	0 1 2 3 4 5 6 N/A	0 1 2 3 4 5 6 N/A
i. Exhibit energy, drive and determination to make one's school and classroom the best possible environment for teaching and learning.	0 1 2 3 4 5 (6)	0 1 2 3 4 5 (6)
j. Exhibit energy, drive and determination to become a professional educator.	0 1 2 3 4 5 (6)	0 1 2 3 4 5 (6)

Comments: It has been a pleasure working with [redacted]. We know she will be a great educator!

We have conferred regarding the knowledge, skills, and competencies demonstrated by the student teacher's classroom performance and work samples. Our signatures below confirm our judgments regarding the student teacher's performance on the five TSPC-prescribed teaching standards.

[redacted] 4-19-05 [redacted] University
Print Name of University Supervisor — Date

University Supervisor's Signature

[redacted] 4-18-05 Elementary
Print Name of Cooperating Teacher — Date — School

Cooperating Teacher's Signature — District

Original: Student's File **First Copy: Student Teacher** **Second Copy: Cooperating Teacher**

[redacted]
Approved June 2004

Figure A2 FSTSR 2007/2008 p.1

1st AUTHORIZATION
FULL-TIME STUDENT TEACHING SUMMARY REPORT

Name of Student: _____ Semester/Year: Spring 2007
Subject: _____ Grade: 2nd Date of Evaluation: 1/23/07 4/19/07
Cooperating Teacher: _____
School: Elementary _____ District: _____ School District

The following standards are set by Teachers Standards and Practices Commission (TSPC) requiring student teachers to demonstrate the knowledge, skills, and competencies necessary for earning an Initial Teaching License at the following authorization level (check appropriate level):

Early Childhood _____ Elementary ✓ Middle Level _____ High School _____

Directions:
This evaluation form will provide summary feedback to the student teacher and [redacted] University faculty members. The following standards are set by Teachers Standards and Practices Commission (TSPC) requiring student teachers to demonstrate the knowledge, skills, and competencies necessary for good teaching and learning.

Consider the characteristics for each of the five standard areas and determine the level of proficiency demonstrated by the student teacher at the conclusion of the student teaching experience. Student teachers should be able to demonstrate proficiency at a **level 3 or 4** for each of the knowledge, skills, and competencies in order to earn the Initial Teaching License. **The [redacted] Supervisor and the Cooperating Teacher both need to determine that each of the standards has been met in order for the student teacher to be eligible for the Initial Teaching License.**

Rating Scale for Standard One:

0	1 – 2	3 – 4	5 – 6
Not yet able to demonstrate the knowledge, skills, and competencies needed to meet the needs of many learners. (Questionable whether the candidate has the potential to meet standard one for the Initial Teaching License during this practicum.)	Developing an awareness & beginning to demonstrate the knowledge, skills, and competencies needed to meet the needs of most learners. (Has the potential to meet standard one for the Initial Teaching License.)	Knows and demonstrates the methods, skills, and strategies needed to meet the needs of most learners. (Regularly meets standard one for the Initial Teaching License.)	Knows and demonstrates well the methods, skills, and strategies needed to meet the needs of most diverse learners. (Exceeds standard one for the Initial Teaching License.)

PLAN FOR INSTRUCTION 1. Candidates plan instruction that supports student progress in learning and is appropriate for the developmental level and demonstrate they are able to:	GF University Supervisor Has Met ___ Not Met ___	Cooperating Teacher Has Met ✓ Not Met ___
a. Select or write learning goals for units of instruction that are consistent with the school's long term curriculum goals, state and district standards, research findings on how students learn, and the physical and mental maturity of one's students.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6
b. Determine the current performance level of one's students with respect to the learning goals established for a unit of instruction.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6
c. Establish objectives within the unit of instruction that will be useful in formulating daily lessons and in evaluating the progress of students toward attainment of unit goals.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6
d. Determine content, skills and processes that will assist students in accomplishing desired unit outcomes, and design learning activities that lead to their mastery	0 1 2 3 (4) 5 6	0 1 2 (3) (4) 5 6
e. Select and organize instructional materials and equipment and technologies needed to teach the unit of instruction.	0 1 2 3 4 (5) 6	0 1 2 3 4 (5) 6
f. Design and adapt unit and lesson plans for all learners, including students with varying cultural, social, and linguistic backgrounds and for exception learners.	0 1 2 (3) 4 5 6	0 1 2 (3) 4 5 6
g. Estimate the time required within a unit for teacher-instruction, student-managed learning and directed practice, student evaluation/reporting, and re-teaching/problem solving.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6

Figure A2 FSTSR 2007/2008 p.2

Rating Scale for Standard Two: **Student Teacher:**

0	1 – 2	3 – 4	5 - 6
Not yet able to demonstrate the knowledge, skills, and competencies needed to meet the needs of **many** learners. **(Questionable whether the candidate has the potential to meet standard two** for the Initial Teaching License during this practicum.)	**Developing an awareness** & beginning to demonstrate the knowledge, skills, and competencies needed to meet the needs of **most** learners. **(Has the potential to meet standard two** for the Initial Teaching License.)	**Knows and demonstrates** the methods, skills, and strategies needed to meet the needs of **most** learners. (Regularly **meets standard two** for the Initial Teaching License.)	**Knows and demonstrates well** the methods, skills, and strategies needed to meet the needs of **most** diverse learners. **(Exceeds standard two** for the Initial Teaching License.)

ESTABLISH CLASSROOM CLIMATE **2. Candidates establish a classroom climate conducive to learning and demonstrate they are able to:**	**GF University Supervisor** Has Met ~~\~~ Not Met _____	**Cooperating Teacher** Has Met ✓ Not Met _____
a. Affirm the dignity and worth of all students and provide the positive support students need to become effective learners.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6
b. Establish, communicate, and maintain rules, procedures and behavioral expectations that provide a safe and orderly environment for learning, are appropriate to the level of development of students, and are consistent with laws governing student rights and responsibilities.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6
c. Employ practices that are equitable and just and support a least restrictive environment for all students.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6
d. Model and reinforce social behavior that supports student learning and development.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6
e. Use knowledge of the influence of the physical, social and emotional climates of students' homes and the community to optimize motivation, learning, and behavior.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6
f. Monitor student conduct, and take appropriate action when misbehavior occurs.	0 1 2 3 (4) 5 6	0 1 2 (3) (4) 5 6
g. Interact thoughtfully and courteously with all students and their families and seeks to resolve conflicts in a professional manner, respecting cultural contexts.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6
h. Use classroom time effectively to provide maximum time for learning.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6
i. Manage instructional transitions decisively and without loss of instructional time.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6
j. Arrange and set up instructional materials and equipment in advance of class to facilitate their effective and efficient use during lessons.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6
k. Coordinate the use of instructional assistants and other support personnel to achieve instructional objectives, if these resources are available in the school setting.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6
	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6

Figure A2 FSTSR 2007/2008 p.3

Rating Scale for Standard Three: **Student Teacher:**

0	1 – 2	3 – 4	5 - 6
Not yet able to demonstrate the knowledge, skills, and competencies needed to meet the needs of **many** learners. **(Questionable whether the candidate has the potential to meet standard three** for the Initial Teaching License during this practicum.)	**Developing an awareness** & beginning to demonstrate the knowledge, skills, and competencies needed to meet the needs of **most** learners. (Has the **potential to meet standard three** for the Initial Teaching License.)	**Knows and demonstrates** the methods, skills, and strategies needed to meet the needs of **most** learners. (Regularly **meets standard three** for the Initial Teaching License.)	**Knows and demonstrates well** the methods, skills, and strategies needed to meet the needs of **most** diverse learners. **(Exceeds standard three** for the Initial Teaching License.)

STANDARDS BASED TEACHING **3. Candidates engage students in planned learning activities and demonstrate they are able to:**	**GF University Supervisor** **Has Met** ↘ **Not Met** _____	**Cooperating Teacher** **Has Met** ✓ **Not Met** _____
a. Choose organizational structures appropriate for the objectives of instruction.	0 1 2 3 **(4)** 5 6	0 1 2 3 **(4)** 5 6
b. Communicate learning outcomes to be achieved and focus student interest on tasks to be accomplished	0 1 2 **(3)** 4 5 6	0 1 2 **(3)** 4 5 6
c. Implement instructional plans that employ knowledge of subject matter and basic skills.	0 1 2 **(3)** 4 5 6	0 1 2 **(3)** 4 5 6
d. Use a variety of research-based educational practices that promote student learning and, are sensitive to individual differences and diverse cultures.	0 1 2 **(3)** 4 5 6	0 1 2 **(3)** 4 5 6
e. Emphasize instructional techniques that promote critical thinking and problem solving, and that encourage divergent as well as convergent thinking.	0 1 2 3 **(4)** 5 6	0 1 2 3 **(4)** 5 6
f. Monitor the engagement of students in learning activities, and the progress they are making, to determine if the pace or content of instruction needs to be modified to assure that all students accomplish lesson and unit objectives.	0 1 2 **(3)** 4 5 6	0 1 2 **(3)** 4 5 6

Rating Scale for Standard Four:

0	1 – 2	3 – 4	5 - 6
Not yet able to demonstrate the knowledge, skills, and competencies needed to meet the needs of **many** learners. **(Questionable whether the candidate has the potential to meet standard four** for the Initial Teaching License during this practicum.)	**Developing an awareness** & beginning to demonstrate the knowledge, skills, and competencies needed to meet the needs of **most** learners. (Has the **potential to meet standard four** for the Initial Teaching License.)	**Knows and demonstrates** the methods, skills, and strategies needed to meet the needs of **most** learners. (Regularly **meets standard four** for the Initial Teaching License.)	**Knows and demonstrates well** the methods, skills, and strategies needed to meet the needs of **most** diverse learners. **(Exceeds standard four** for the Initial Teaching License.)

ASSESSMENT **4. Candidates evaluate, act upon, and report student progress in learning, and demonstrate they are able to:**	**GF University Supervisor** **Has Met** ↘ **Not Met** _____	**Cooperating Teacher** **Has Met** ✓ **Not Met** _____
a. Select or develop non-biased, valid, and reliable tests, performance measures, observation, student interviews, or other formal or informal assessment procedures to determine the progress of all students.	0 1 2 3 **(4)** 5 6	0 1 2 3 **(4)** 5 6
b. Document student progress in accomplishing state content standards and district standards, prepare data summaries that show this progress to others, and inform students, supervisors, and parents about the learning process.	0 1 2 3 **(4)** 5 6	0 1 2 **(3)** **(4)** 5 6
c. Refine plans for instruction, establish alternative goals or environments, or make referrals when appropriate.	0 1 2 3 **(4)** 5 6	0 1 2 3 **(4)** 5 6
d. Assemble, reflect upon, interpret and communicate evidence of one's own effectiveness as a teacher, including evidence of success in fostering student progress in learning, and evidence of effectiveness in planning further intervention.	0 1 2 3 4 **(5)** 6	0 1 2 3 4 **(5)** 6

Figure A2 FSTSR 2007/2008 p.4

Rating Scale for Standard Five: Student Teacher:

0	1 – 2	3 – 4	5 - 6
Not yet able to demonstrate professional behaviors, ethics, and values required of a licensed educator. **(Questionable whether the candidate has the potential to meet the standards for the** Initial Teaching License during this practicum.)	**Developing an awareness** & beginning to demonstrate professional behaviors, ethics, and values required of a licensed educator. (Has the **potential to meet standard** five for the Initial Teaching License.)	**Knows and demonstrates** on a regular basis the professional behaviors, ethics, and values required of a licensed educator. (Regularly **meets standard five** for the Initial Teaching License.)	**Knows and demonstrates well** professional behaviors, ethics, and values required of a licensed educator. (**Exceeds standard five** for the Initial Teaching License .)

PROFESSIONAL BEHAVIOR **5. Candidates exhibit professional behaviors, ethics and values and demonstrate they are able to:**	GF University Supervisor Has Met ✓ Not Met _____	Cooperating Teacher Has Met ✓ Not Met _____
a. Be dependable.	0 1 2 3 4 (5) 6	0 1 2 3 4 (5) 6
b. Meet work schedule demands.	0 1 2 3 4 (5) 6	0 1 2 3 4 (5) 6
c. Dress appropriately.	0 1 2 3 4 (5) 6	0 1 2 3 4 (5) 6
d. Be aware of and act in accordance with school policies and practices.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6
e. Understand the organization culture and expectations that operate within a school and that impact student and student and student learning.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6
f. Interact constructively with colleagues, administrators, supervisors, and other school staff, families, and members of the community.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6
g. Collaborate with parents, colleagues, and members of the community to provide internal and external assistance to students and their families if needed to promote student learning.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6
h. Perform advisory functions for students in formal and informal settings.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6
i. Function as a member of an interdisciplinary team to achieve long-term goals.	0 1 2 3 (4) 5 6	0 1 2 3 (4) 5 6
j. Exhibit energy, drive and determination to make one's school and classroom the best possible environment for teaching and learning.	0 1 2 3 4 (5) 6	0 1 2 3 4 (5) 6
k. Exhibit energy, drive and determination to become a professional educator.		

Comments: _____

We have conferred regarding the knowledge, skills, and competencies demonstrated by the student teacher's classroom performance and work samples. Our signatures below confirm our judgments regarding the student teacher's performance on the five TSPC-prescribed teaching standards.

Print Name of University Supervisor — Date 4/23/07 — [redacted] University

University Supervisor's Signature

Print Name of Cooperating Teacher — Date 4/19/07 — School

Cooperating Teacher's Signature — District [illegible] District

Original: Student's File — First Copy: Student Teacher — Second Copy: Cooperating Teacher

[redacted] University
Revised June 2006

Appendix B

Table B

FSTSR Sections and Associated Externally Identified Factors

Section Headings & External Factors

Section One: Plan for Instruction	Items
1a: Learning goals	1a,
1a: DAP	1a, 1f, 2b
1b: Assessment	1b, 3f, 4a
1c: Objectives	1c,
1d: Pedagogical content knowledge	1a,
1d: Instructional planning	1d, 1f, 3a
1e: Materials management	1e, 2j
1e: Technology	1e,
1f: Instructional planning	See 1d
1f: DAP	See 1a
1f: Differentiation	1f, 3d, 3f, 4c
1f: Cultural competence	1f, 2g, 3d
1g: Time management	1g, 2h
Section Two: Establish Classroom Climate	
2a: Value all learners	2a
2a: Positive support	2a
2b: Management	2b, 2d, 2f
2b: DAP	See 1a above
2b: Legality	2b
2c: Equitable practice	2c
2c: Least restrictive environment	2c
2d: Role model	2d
2d: Management	See 2b
2e: Applied knowledge of bio-ecology	2e
2f: Management	See 2b
2g: Interactions with students & family	2g
2g: Conflict resolution	2g
2g: Cultural competence	See 1f
2h: Time Management	See 1g
2i: Transition Management	2i
2j: Materials Management	See 1e
2k: Coordinate support personnel	2k
Section Three: Standards Based Teaching	
3a: Instructional planning	See 1d
3b: Clear outcomes	3b
3b: Focuses student interest	3b
3c: Instruction	3c, 3d, 3e
3c: Content knowledge	3c
3d: Instruction	See 3c
3d: Differentiation	See 1f
3d: Cultural Competence	See 1f
3e: Instruction	See 3c
3e: Promote critical thinking	3e
3f: Assessment	See 1b
3f: Pacing	3f
3f: Differentiation	See 1f

Table B (continued)

FSTSR Sections and Associated Externally Identified Factors

Section Four: Assessment	Items
4a: Assessment	See 1b
4b: Documentation for stakeholders	4b
4c: Differentiation	See 1f
4c: Appropriate referrals	4c
4d: Reflective Practice	4d
Section Five: Professional Behavior	
5a: Dependable	5a, 5b
5b: Dependable	See 5a
5c: Dress appropriately	5c
5d: Follows school policies	5d
5e: Knows organizational culture	5e
5f: Collegiality	5f
5f: Interact with parents/community	5f
5g: Collaborates with bioecology	5g
5g: Seeks resources for students/families	5g
5h: Advisory functions	5h
5i: Interdisciplinary team player	5i
5j: Professional drive	5j, 5k
5k: Professional drive	See 5j