THE EFFECT OF THE SCHOOLS ATTUNED

PROGRAM ON EDUCATORS' SELF-EFFICACY

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TSES   Teacher Sense of Efficacy Scale

Partial η^2 partial Eta squared

CHAPTER I

INTRODUCTION

Educational research over the last 10 years has revealed that approximately 10 million children in the United States are poor readers. The National Center for Education Statistics (2001b) reported that 36% of fourth graders read below the "basic" level on the National Assessment of Educational Progress reading test. Reading failure for African-American, Hispanic, and limited-English speakers ranges from 60-70% (Moats, 1999). Low socio-economic status is not always a factor, however. One third of poor readers have parents who are college educated. Three-fourths of those who are poor readers in third grade will remain poor readers in high school (Shaywitz, Shaywitz, Fletcher, Pugh, Gore, Constable, et al., 1997) even though Americans spend between $5 and $8 billion on tutoring and other supplemental educational assistance every year (Education Update, 2003). Educational research reveals difficulties in other areas such as writing and math. Although students' writing has improved slightly,

only 24% of twelfth graders, 31% of eighth graders, and 28% of fourth graders are able to write stories or essays proficiently (National Center for Education Statistics, 2002a, p. 2). According to the National Center for Education Statistics (2001a), math scores have not increased since 1996.

In the past, "literacy" was defined as the ability to read. However, The Workforce Investment Act of 1998 (Public Law 105-220) more liberally defined literacy as "an individual's ability to read, write, speak in English, compute and solve problems at levels of proficiency necessary to function on the job, in the family of the individual, and in society" (p .112). Today, being at the lowest literacy level likely precludes an adult from being able to "locate eligibility from a table of employee benefits, find an intersection on a map, enter background information on a social security card, or calculate total costs of a purchase from an order form" (National Center for Education Statistics, 1999a, p. 15).

It is estimated that 34% of adults lack the basic literacy skills required for a typical job (American Management Association, 2001, p. 1). As a result, Kurtz (2001) estimates American business productivity losses range between $140 billion and $300 billion each year. On

an individual level, lifetime earnings for a highly-literate man totals $1.36 million more than a low-literate man (Conference Board, 1999). For a highly-literate woman, the amount is 362% more than a woman with low-literacy skills (p. 12).

As a result of these factors, accountability in education is becoming more important every year. Emphasis on student assessment and achievement has steadily increased across the nation. Student performance is the gauge by which educational systems are determined to be effective in educating students. The White House Internet website explains that accountability in the subjects of reading and math is emphasized specifically in The No Child Left Behind Act of 2001 (Public Law 107-110), which:

>Increases accountability for student performance.
>States, districts and schools that improve
>achievement will be rewarded. Failure will
>be sanctioned. Parents will know how well
>their child is learning, and that schools are
>held accountable for their effectiveness with
>annual state reading and math assessments
>in grades 3-8. (p. 3)

In 1994, the Goals 2000: Educate America Act was passed by Congress. Goal 3 of the National Education Goals applies specifically to student achievement and includes students' transition to the world of work:

>By the year 2000, American students will leave
>grades four, eight, and twelve having

demonstrated competency in challenging subject matter including English, mathematics, science, foreign languages, civics and government, economics, arts, history, and geography, and every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our Nation's modern economy. (National Education Goals Panel, 1999, p. vi)

High student achievement is essential because of the positive economic impact it can have on the individual and society as the student transitions from school to work. Schools, educational programs, and teachers are considered to be of high quality if the achievement of students is also found to be high. The reverse is said about schools, programs, and teachers if student performance is low.

According to Darling-Hammond (1999a), teacher quality is highly related to student achievement. The Dallas Independent School District discovered that students' reading and math scores went up by 16% for students who were taught for three years by high-quality teachers. For students taught by low-quality teachers, scores decreased 18 % in reading and 33% in math (Camphire, 2003). Other variables such as student socio-economic status, student language background, and parents' educational level have been found to be less significantly related to student achievement than teacher quality (Darling-Hammond, 1999b).

Research demonstrates that high-quality teachers share common characteristics. They have completed a greater amount of educational coursework than their colleagues and are content-knowledgeable (Ferguson & Womack, 1993; Monk, 1994), constantly evaluate student learning (Bembry, Jordan, Gomez, Anderson, & Mendro 2003), and have participated in recent on-going professional development (Darling-Hammond, 1999a; Southeast Center for Teaching Quality, 2003). High-quality teachers also have a strong sense of self-efficacy, a "belief in the capacity of students to learn *and* teachers' belief in their own capacity to help students learn at high levels" (Southeast Center for Teaching Quality, 2003, p. 1). It is possible that strong self-efficacy affects teachers as adult learners, empowering them to keep learning through participation in professional development programs, to enroll in additional college coursework, and inspire them to be insatiable learners.

Self-Efficacy Theory

Social Cognitive Theory (Bandura, 1977, 1986, 1993, 1997) provides the foundation for the concept of self-efficacy and explains that the actions of humans are impacted by their self-efficacy beliefs. To attain their goals, people think about and anticipate situations,

determine possible future actions, and consider the consequences of those actions. Those thought processes are influenced by peoples' beliefs about, or their self-efficacy for, their abilities to effectively plan and act to achieve the goal (Bandura, 1997). In the field of education, teacher self efficacy has been defined as "teachers' belief or conviction that they can influence how well students learn, even those who may be difficult or unmotivated" (Guskey & Pessaro, 1994, p. 637).

Teachers with high levels of self-efficacy have been found to be more willing to attempt new ideas that could impact their students' learning (Guskey, 1988; Ross, 1992), and will persevere in challenging situations (Bandura, 1997). In fact, they look forward to the challenges and consider any failure as an opportunity to work harder (Bandura, 1994). Teachers with high self-efficacy spend more time on instruction, are less critical of students, and provide more support to students experiencing difficulties (Gibson & Dembo, 1984; Soodak & Podell, 1998). They are committed to and excited about teaching (Allinder, 1994; Coladarci, 1992; Guskey, 1984). "Persons who have a strong sense of efficacy deploy their attention and effort to the demands of the situation and are spurred by obstacles to greater effort" (Bandura, 1986, p. 394).

In contrast, teachers with low self-efficacy are easily discouraged in challenging teaching situations and suffer stress and depression (Bandura, 1994). Teachers with low self-efficacy are more critical of students and spend less time on instruction (Gibson & Dembo, 1984). "Self-doubt creates the impetus for learning but hinders adept use of previously established skills" (Bandura, 1986, p. 394). "If self-efficacy is lacking, people tend to behave ineffectually, even though they know what to do" (p. 425). Accordingly, teachers who do not believe in their own abilities to improve student achievement, even if they have completed additional educational coursework and professional development, will not effectively apply the knowledge they possess because of low self-efficacy in their ability to improve student achievement. Some researchers state that self-efficacy, the belief in one's ability to accomplish the task of motivating and instructing students to effect high student achievement, may be the most important factor in student performance (Ashton & Webb, 1986; Bandura, 1997; Pajares, 2002a).

Studies of collective teacher self-efficacy are increasing. Collective teacher self-efficacy is the belief of the entire school faculty that they can positively impact student achievement (Goddard, Hoy, & Woolfolk Hoy,

2000). One of the first studies of this kind was
undertaken by Bandura (1993), who concluded that student
achievement is positively related to collective teacher
self-efficacy. Others found that collective teacher self-
efficacy can be a better predictor of student achievement
than student socio-economic level (Bandura, 1993; Goddard,
Hoy, & Woolfolk Hoy, 2000). Teachers' self-efficacy
beliefs impact their teaching and the self-efficacy and
achievement of their students (Ashton & Web, 1986; Pajares,
2002a).

Self-efficacy influences the actions people take and
the amount of effort expended in activities. People select
tasks or activities based upon their level of self-efficacy
for the task, participating in activities in which they
feel efficacious (Bandura, 1994). High-quality teachers
may initially have a strong sense of self-efficacy prior to
participating in professional development. Other teachers
may have low self-efficacy initially but find it
strengthened during and after participation in professional
development, especially as their effectiveness in program
implementation is demonstrated in the classroom by improved
student achievement (Guskey, 2002, p. 385).

The self-efficacy of high-quality teachers may empower
them to be self-directed learners who choose to participate

in professional development as a means of overcoming experienced failure, obstacles, or problems in their classrooms. Teacher participation in professional development programs can lead to an increase in a teacher's sense of self-efficacy and the process can become circular. As self-efficacy increases, the teacher may participate in more professional development, persevere in challenging classroom situations, and provide more support to students experiencing difficulties, all of which positively impact students.

<div align="center">Adult Education and Professional Development</div>

Continuing professional development, also known as continuing professional education, potentially improves professional practice by providing a forum for teachers to update their skills (Cervero, 2001, p. 16). "Surely one of the major changes of the past 20 years has been the incorporation of continuing education into accountability systems for professional practice" (p. 23). Continuing professional development promotes professional competence and assists with skill improvement. "A pivotal need is for every professional to be able to carry out his or her duties according to the highest possible standards of character and competence" (Houle, 1980, p. 7).

"Professional development programs are systematic efforts to bring about change in the classroom practices of teachers, in their attitudes and beliefs, and in the learning outcomes of students" (Guskey, 2002, p. 381).

Participation in professional development is an Oklahoma state mandate for teaching certificate renewal. With the current emphasis on student achievement and educational accountability, teachers need and want more knowledge about learning and how the individual student learns. In fact, when teachers were surveyed by the National Foundation for the Improvement of Education to discover their motivation for participating in professional development, 73% reported they wanted to increase student achievement, 55% wanted to improve their teaching skills, and 34% wanted to increase their knowledge (Renyi, 1998).

Due to the No Child Left Behind Act, the emphasis on professional development for teachers is that it be research based and impact student achievement. Headline news advises that teachers are increasingly faced with difficulties in classroom management, in the use of instructional strategies, and in engaging students in learning. Teachers are attracted to professional development that "expands their knowledge and skills,

contributes to their growth, and enhances their effectiveness with students" (Guskey, 2002, p. 382).

Classroom difficulties faced by the teacher do not always relate to the coursework taught in a university teacher-education program. Professionals are problem solvers, and real-life situations force them to handle problem situations that may not be "in the book" (Cervero, 1992; Daley, 1999). As adult learners, educators should be self-directed and motivated to learn more about new methods and strategies. They will frequently create their own solutions to their instructional difficulties with the goal of raising student performance. Their creations are derived from the new methods or strategies learned and also include adaptations made by the teacher for a particular group of students. The adaptations are based upon the teachers' individual experiences in the classroom, upon what was learned in educational methods coursework, and upon what has been the most effective method, rule, or strategy for them in the past. The adaptations are developed by reflecting upon one's practice. For example,

> An artful teacher sees a child's difficulty
> in learning to read not as a defect in the
> child but as a defect of his own instruction."
> So he must find a way of explaining what is
> bothering the pupil. He must do a piece of
> experimental research, then and there, in the
> classroom. And because the child's difficulties

may be unique, the teacher cannot assume that
his repertoire of explanations will suffice,
even though they are "at the tongue's end."
He must be ready to invent new methods and
must "endeavor to develop in himself the
ability of discovering them." (Schon, 1983,
p. 66)

This Reflection-*in*-Action describes an educator
experiencing uncertainty, confusion, or puzzlement in a
certain classroom situation. The teacher ponders the
situation, mentally works back and forth what was learned
in educational methods classes at the university level,
adds anything similar that prior experiences have taught,
and creates something new. The teacher "carries out an
experiment which serves to generate both a new
understanding of the phenomena and a change in the
situation" (Schon, 1983, p. 68). Experienced teachers
might be more comfortable with the uncertainty of the
situation, will reflect upon their practice, and will
attempt something new to solve the problem (Arlin, 1999;
Daley, 1999; Livneh & Livneh, 1999).

However, there is some evidence that novice educators
may discover that strategies and rules learned in a pre-
service education methods class are not applicable to this
situation or are not effective with this student, and they
may go no farther in attempting to solve the problem
(Daley, 1999a). For experienced and novice teachers,

attempting to effectively use some new method or strategy

is quite difficult to do without the development of new

knowledge and skills. One effective strategy to develop

the needed new knowledge and skills is to participate in

professional development as a self-directed or self-

motivated learner.

   According to Livneh & Livneh (1999), an educator's

level of self-motivated learning was the most predictive

factor on the amount of time spent in professional

development over a 12 month period. These researchers also

stated that educators who are self-motivated, or self-

directed, are:

> Able to learn by themselves, are curious,
> achievement-motivated, able to evaluate
> their own learning, take action rather than
> waiting for things to happen, learn in a
> variety of ways including independently using
> the library, view themselves as learners, have
> a positive attitude toward education, are
> energetic, emphasize organizing their
> activities, and were interested in reading,
> were more likely to spend more time in learning
> activities over the past year. (Livneh & Livneh,
> 1999, p. 99)

Several studies cited in the report on Teacher Quality and

Student Achievement by the Center for the Study of Teaching

and Policy (Darling-Hammond, 1999a) found positive

relationships between teacher quality and college

coursework, including pre-service teacher education

coursework. In one particular study that was conducted in 1993, Ferguson and Womack reported:

> The amount of education coursework completed
> by teachers explained more than four times
> the variance in teacher performance (16.5
> percent) than did measures of content knowledge
> (NTE scores and GPA in the major), which
> explained less than 4 percent. (p. 8)

Over 30 years ago, the major influence for adult participation in continuing educational activities was also found to be the amount of prior schooling (Houle, 1961). Adults' schooling was found to influence other areas, such as their occupation, choice of community in which to live, and the length of residency in that community. To determine what to learn and how to go about doing so, adults reflect internally on their personal and professional goals, their sociological needs, their self-efficacy for learning, and any outside influences (Garrison, 1997).

For adults, those outside influences and professional goals may be job related. For educators, job-related influences and goals revolve around skill development in classroom management, use of instructional strategies, and student engagement. Ineffective use of those skills results in an ineffective learning environment for students and dissatisfaction for the teacher. The capacity for

reflection, for self-direction in one's learning, and strong self-efficacy are important personal qualities for educators. Those qualities influence teachers' participation in professional development, their beliefs in their ability to help students learn, and they directly impact their students. Teachers' participation in professional development is also influenced by state and federal issues.

One issue facing Oklahoma educators is student assessment. Analysis of student performance and intervention for the individual student is required by the No Child Left Behind Act (2001), which allows state professional development funds to be provided for activities that improve teachers' and principals' knowledge in:

(1) One or more core academic subjects that teachers teach [Section 2123(a)(3)(A)(i)];

(2) Effective instructional strategies, methods, and skills and use of assessments to improve teaching practices and student academic achievement [Section2123(a)(3)(A)(ii)];

(3) Training in how to teach and address the needs of students with different learning styles, particularly students with disabilities, students with special learning needs (including students who are gifted and talented), and students with limited English proficiency [Section 2123(a)(3)(B)(ii)];

(4) Training in methods of improving student behavior in the classroom and identifying

early and appropriate interventions to
help special needs children learn
[Section 2123(a)(3)(B)(iii)];
(5) Training in how to understand and use data
and assessments to improve classroom practice
and student learning. [Section 2123(a)(3)(A)
(v)]

However, analysis, intervention, observing, and

managing diverse student learning in the regular education

classroom are not always taught in university teacher

education programs (Levine, 2003a).

Historically, teachers have not been taught how
to engage in thorough analyses of students to
identify skill levels and abilities. Even today,
it is not a systematic portion of a basic
educational coursework, and those teachers who
engage in it successfully do so almost as an
individual personal skill. (Bembry, Jordan,
Gomez, Anderson, & Mendro, 1998, p. 21)

Until recently, there has not been a professional

development program for the regular classroom teacher that

encompasses both the *content* of neurological and

developmental functions and their impact on learning and

the *process* of observing classroom behaviors to identify,

understand, and manage student strengths and weaknesses.

Schools Attuned

One professional development program for public school

educators currently being provided by the Oklahoma State

Department of Education is Schools Attuned. Offered by All

Kinds of Minds (AKOM), a non-profit organization formed in

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1995 in North Carolina, Schools Attuned is based upon ideas and methods developed by Mel Levine, M.D., and his colleagues at the School of Medicine, the University of North Carolina, in Chapel Hill. Schools Attuned is a year-long program offering teachers and administrators new methods for recognizing, understanding, and managing learning differences in the classroom.

Schools Attuned consists of a 6-day Core Course and an additional 10 hours of follow-up or Practicum held during the school year. The Core Course provides information through interactive activities about categories or constructs of neurological and developmental functions that affect learning. "Neurodevelopmental functions are basic abilities of the human mind that overlap and transact extensively. They come together to form academic subskills" (Levine & Reed, 1998, pp. 8-10) (See Figure 1).

Figure 1: The Neurodevelopmental Constructs (Levine, 2000).

Temporal/ Sequential Ordering Systems	Spatial Ordering Systems	Higher Order Thinking	Social Cognition
Sequential Awareness	Spatial Awareness	Concept Formation	Verbal Pragmatics
Sequential Perception	Spatial Perception	Critical Thinking	Social Behaviors
Sequential Memory	Spatial Memory	Creativity	Political Acumen
		Brainstorming	
Sequential Output	Spatial Output	Problem Solving	**Neuromotor Functions**
Time Management	Materials Management	Rule Use	Gross Motor Function
Higher Sequential Thinking	Higher Spatial Thinking	Reasoning/ Logical Thinking	Fine Motor Function
		Mental Representation	Graphomotor Function
Memory		**Attention**	**Language**
Short Term Memory		Mental Energy Controls	Receptive Language
Active Working Memory		Processing Controls	Expressive Language
Long Term Memory		Production Controls	

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Within each category or construct are three to seven functions, some of which are further divided into components. These constructs provide the foundation for all of the Core Course and Practicum activities.

The five Practicum sessions occur during the school year to provide teachers practice in connecting these neurodevelopmental constructs to the subjects of Reading, Writing, and lesson plan composition to teach the constructs to their students. A distance learning component of Schools Attuned includes the online Learning Base through which teachers are able to access lesson plans, resource materials, and other information to help them with the implementation of Schools Attuned in their classrooms and schools.

Schools Attuned provides both scientifically researched content about learning and a systematic process of identifying student strengths and weaknesses. Schools Attuned helps teachers understand that a student who misbehaves is not necessarily a miscreant but is one who may not understand the instruction. Strategies are provided for the teacher to assist the individual student and to assist the entire class at once. Solutions to problems with classroom management and student engagement through the use of effective instructional strategies are

also provided, and they are practiced, reflected upon, and discussed by the participants. Schools Attuned may affect teachers' sense of self-efficacy in being able to better understand student learning and to intervene with individual students. Schools Attuned may assist teachers in more effectively balancing their instructional techniques with the learning needs of their students. Either result could improve student achievement.

<u>Problem</u>

National student achievement in the areas of reading, math, and writing must improve in order for the United States to be competitive in a global economy. Research has shown that the level of teacher self-efficacy is strongly related to student achievement (Ashton & Webb, 1986; Ross, 1992; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). There is no research available about Oklahoma teachers' self-efficacy, including no historical information on self-efficacy strength over time and whether it has risen or fallen. There is no knowledge about the impact of specific professional development programs on Oklahoma teachers' self-efficacy specifically for classroom management, for the use of instructional strategies, and for student engagement before and after participation in a professional development program. There are no published studies

involving Oklahoma teachers' self-efficacy that have included a control group.

A program has been developed which is based on medical and education research to help teachers increase their level of expertise in observing students, analyzing student work, and meeting students' diverse learning needs. This program is called Schools Attuned, which has the potential to increase teachers' self-efficacy because it helps them analyze the impact of their teaching skills on student learning. However, no research has been conducted to measure any change in self-efficacy to implement Schools Attuned and to influence specific skills in classroom management, instructional strategies, and student engagement of teachers who are completing that professional development program.

Purpose

The purpose of this study was to measure the effect of the Schools Attuned professional development program on the participants' self-efficacy for classroom management, instructional strategies, and student engagement and to implement Schools Attuned. Self-efficacy is crucial to job performance, affecting educators and their students. Perceptions of self-efficacy were measured with the Core Course Inventory (see Appendix A) by pre-test, post-test,

and follow-up measurements for both an experimental and control group.

<div align="center">Research Hypotheses</div>

The hypotheses for this study were based upon the Core Course Inventory which has two scales: (1) the Teacher Sense of Efficacy Scale (TSES) developed at Ohio State University (Tschannen-Moran & Woolfolk Hoy, 2001) and (2) a Schools Attuned scale (see Appendix A). Self-efficacy strength for student engagement, instructional strategies, and classroom management are measured by the TSES in three subscales. The scale measuring self-efficacy for Schools Attuned implementation was added to encompass those techniques, strategies, vocabulary, and philosophies specific to Schools Attuned. The four null hypotheses are:

H1. There is no significant difference over time in the Student Engagement efficacy scores of educators who participated in the Schools Attuned program compared to those who did not.

H2. There is no significant difference over time in the Instructional Strategies efficacy scores of educators who participated in the Schools Attuned program compared to those who did not.

H3. There is no significant difference over time in the Classroom Management efficacy scores of educators who participated in the Schools Attuned program compared to those who did not.

H4. There is no significant difference over time in the Implementation of Schools Attuned efficacy scores of educators who participated in the Schools Attuned

program compared to those who did not.

Definition of Terms

Teacher Self-Efficacy: Teacher self efficacy has been defined as "teachers' belief or conviction that they can influence how well students learn, even those who may be difficult or unmotivated" (Guskey & Pessaro, 1994, p. 637).

Teacher Sense of Efficacy Scale: The TSES is an instrument developed to enable teachers to evaluate teaching tasks and personal mastery, with subscales of Classroom Management, Student Engagement, and Instructional Strategies (Tschannen-Moran & Woolfolk Hoy, 2001).

Schools Attuned: Schools Attuned is a professional development program, created by Mel Levine, M.D., for regular classroom educators of grades kindergarten to 12 to help them recognize, understand, and manage learning differences in the classroom.

Student Engagement: Student engagement refers to improving student interest and motivation in the learning process, assisting struggling students, providing educational support to parents, improving student self-efficacy, even for the most difficult student.

Instructional Strategies: Instructional strategies refers to the use of a variety of methods, materials, and media to encourage student higher order thinking, adjusting instruction to meet individual needs, using a variety of assessments of comprehension, and providing a challenging learning environment.

Classroom Management: Classroom management refers to the creation of a safe and orderly learning environment to meet the learning needs of all students, including coping with those who are disruptive and defiant to those who are very capable.

CHAPTER II

REVIEW OF LITERATURE

Learning is simply defined as "the gaining of knowledge or a skill" (World Book, 2001, p. 1192). It is abstract. It is an unobservable mental process. What is observable, however, are the results or outcomes of learning. Learning is described cognitively and behaviorally by various experts as "a transformation in the brain, problem solving, an internal process that leads to behavioral change, the construction and exchange of personally relevant and viable meanings, a retained change in disposition or capability that is not ascribable to growth, and a process of changing insights, outlooks, expectations, or thought patterns" (Smith, 1982, p. 34). As applied to adults, learning "occurs throughout the lifetime and may be intentional or random, both processes and results, and involves acquiring new values, skills, information, attitudes, and understandings" (p. 37). One learning theory that is concerned with the processes people use to learn is Constructivism.

<u>Constructivism</u>

Constructivists such as Dewey, Piaget, and Vygotsky proposed that new learning is constructed when the learner makes mental connections by a process of reflecting on prior experiences, knowledge, and the new information (Merriam & Caffarella, 1999, pp. 261-263). The new learning is not identical for all learners because what is learned is influenced by the prior experiences and the perceptions of each individual. "Knowledge is a construction of the individual's subjective reality" (Keiny, 1994, p. 1). The constructivist teacher is a facilitator of learning instead of a conveyor of knowledge, building learning activities rather than lectures around students' experiences and prior knowledge to connect with students' lives (Graffam, 2003).

The learning activities trigger feelings and reflective thought about the new information, and when combined with practical application, new learning occurs (Daley, 2003). Constructivist methods include the use of open-ended questions rather than those triggering repetition of facts and opportunities to try out and practice new ideas. This type of learning is considered "genuine" and real-life learning in contrast to learning that occurs in order to pass an exam (Graffam, 2003).

Constructivists such as Piaget posit that learning is constructed by the individual through an internal process, while others such as Vygotsky contend that learning is constructed by a process of social interaction and discussion with others, and still others believe it is a combination of the two (Merriam & Caffarella, 1999). However, constructivists agree in principle that active, real-life learning is constructed by reflection upon prior knowledge and experiences. This principle aligns with adult learning principles which acknowledge adults as self-directed learners who have valuable experiences (Knowles, 1998), who have the ability to reflect (Schon, 1983), and who want solutions for real problems in their lives (Merriam & Caffarella, 1999).

Adult Learning

Society generally considers people to be adults when they can legally vote and marry without permission, perform adult roles such as working full time, and are able to assume more responsibility and self-directedness in conducting their lives (Knowles, 1998). Adult learning is different from the learning of children because growth, life experiences, prior learning, internal motives, and self-directedness bring a different focus to adult learning needs (Knowles, 1998; Smith, 1982). In contrast, children

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bring little life experience upon which to build a solid knowledge foundation and are dependent upon the teacher as a conveyor of knowledge. They participate in a learning situation that is not voluntary since they are legally required to attend school for years. They need assistance and guidance to learn to transfer knowledge between subject areas, and are motivated to learn because of external reinforcements such as grades and achievement (Knowles, 1998; Smith, 1982). To encourage and promote adult learning, it is important to know how and where adults learn.

Adult learning occurs in many forms and in four types of settings: formal, informal, non-formal and self-directed situations (Merriam & Caffarella, 1999). Formal settings are the traditional classroom environments provided through colleges and universities, vocational-technical schools, museums, libraries and community-based organizations, religious organizations, industrial training, and governmental agencies (p. 27). Non-formal settings are less structured and more flexible than formal settings, and may be affiliated with the learner's culture, and with change and social action. Examples of these settings include book clubs, garden clubs, discussion groups, and political groups (pp. 30-31).

Self-directed and informal settings are similar and combined as the learning is initiated and sustained by the adult in the natural setting of work or home (Merriam & Caffarella, 1999, p. 32). Self-directed learning is "a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes" (Knowles, 1975, p. 18). For example, people choose to learn more about their hobbies after retirement when they have more time to devote to their own interests. Adults seeking job promotions, new employment, or professional licensure frequently learn new skills through distance-learning and organizational programs that provide professional development. Medical conditions often arise which motivate people to immerse themselves in new learning about health issues. This learning may occur in such non-formal settings as the home utilizing the computer, the internet, or books about the health topic. For those who are willing, learning can occur throughout adulthood.

Adults who are willing to learn are valued employees of organizations because their abilities to problem-solve and be self-directed result in increased employee

productivity, which benefits the organization and society

(Knowles, 1998). "Excellent job performance often

translates into greater job security, higher salaries, and

employees' overall high level of interest and satisfaction

in their work" (Stolovitch & Keeps, 1999, p. 17). The

application of effective adult learning principles and

methods are critical to satisfying the learning needs and

objectives of adults. "Developing a welcoming and

comfortable atmosphere, providing the right materials, and

linking these materials to learners' past and future

experiences is critical in assisting adults to learn from

their experiences" (Merriam & Caffarella, 1999, p. 224)

<u>Andragogy</u>

One significant model of adult learning is andragogy,

"the art and science of helping adults learn" (Knowles,

1980, p. 43). Knowles, known as the father of modern

andragogy, produced a model of adult learning which

acknowledges accepted principles of how adults learn best

(Knowles, 1984; Merriam & Caffarella, 1999). Originally,

andragogy (Knowles, 1980) was based upon four assumptions:

(1) The adult's self-concept moves from one of
    being a dependent personality toward one of
    being a self-directed being.
(2) The adult accumulates a growing reservoir
    of experience that becomes an increasing
    resource for learning.
(3) The adult's readiness to learn becomes

oriented increasingly to the developmental
tasks of social roles.

(4) The adult's time perspective changes from
one of postponed application of knowledge
to immediacy of application, and accordingly,
orientation toward learning shifts from one
of subject-centeredness to one of problem-
centeredness. (pp. 43-45)

Knowles (1998) later expanded the model by adding two more

assumptions about adult learners: adult learners need to

know why learning something is important prior to doing so

and adult motivation is internal. Adults take time to

determine if possible learning gains are worth the effort

and valuable to them. Knowles (1998) posits that the most

effective adult motivators are found to be increased job

satisfaction, self-esteem, and quality of life.

The ability and even the need of adults to be self-

directed is the foundation of andragogy. Self-directed

adults diagnose their own learning needs, form goals and

action plans to meet those needs, identify available

resources, take action, and then evaluate the success or

failure of the process in relation to meeting their goals

(Knowles, 1975). Prior to the development of andragogy,

instructional strategies used by teachers of adults were

identical to strategies used to teach children with the

teacher as the only conveyor of knowledge. Adult students'

prior experiences and prior learning were not considered

valuable contributions to the learning and were not cultivated as a learning resource. Adults want their prior experiences and knowledge to be respected because "their experience is who they are" (Knowles, 1998, p. 66). Adults identify themselves by the roles they have in society such as being a parent or grandparent, by the work they do, and by their free-time activities such as golfing or volunteering at a hospital. Adults' roles and experiences influence how they construct understanding and meaning.

<div align="center">Learning How to Learn</div>

The adult learning model, learning how to learn, illustrates the importance of matching instructional strategies with individual learning characteristics and the strategies adults use to effectively acquire knowledge and skills (Smith, 1982, p. 4). The three sub-processes that fully involve the learner identified in this model are planning, conducting, and evaluating learning activities (p. 6). The planning process includes the identification of learning needs and goals and the selection of resources and strategies. The conducting process includes learning to navigate the procedures and resources involved in obtaining learning, including following formal procedures at universities and in receiving and giving feedback. Receiving and giving feedback requires skills in

communicating with others, in collecting, analyzing, and storing information for future use, and in retrieval of information when needed (Peterson & Van Fleet, 2004). The evaluating process occurs as adults determine whether their goals were met and how to proceed. The success of using these processes depends upon the effectiveness of the methods and strategies individual adults use to learn.

Learning how to learn involves the identification of learners' needs, their individual learning characteristics, and the instructional methods employed (Smith, 1982, p. 17). Learners' needs include a general understanding of themselves, the basic skills of reading and writing, working with others, and of self-direction (pp. 20-22). Learning characteristics are the individual ways people process information and approach problems during learning activities (p. 23). Instructional methods are the purposeful efforts to help adults learn more effectively and to become more successful learners (p. 25). Understanding how to learn is beneficial to all learners and influences the levels of skill and knowledge of adult learners. The Learning How to Learn model targets this kind of knowledge.

This model describes four categories of adult learners: (a) the undereducated who experience economic

problems because they lack learning skills for various
reasons and "lack faith" in the belief that furthering
their education will improve their situation; (b)
transitionals who are returning to college after losing or
changing a job or whose children are grown and gone from
the house; (c) those adults over 60 who may or may not
choose to attend school to pursue new learning; and (d) the
professionals who enjoy and are expected to participate in
continuing education (Smith, 1982, pp. 49-53). Although
adults in all of these categories participate in self-
directed learning projects, the group most consistently
involved in self-directed learning is the professional (p.
52).

Not only do professionals participate in job-related
training, but they take classes to learn foreign languages,
to learn about current affairs, psychology, and their
hobbies (Smith, 1982, p. 52). Professionals participate in
job-related learning or continuing professional education
throughout their careers to maintain professional and
personal competence (p. 52). "Every professional needs to
be able to carry out his or her duties according to the
highest possible standards of character and competence.
One essential way to meet this need is for every practicing

professional to engage in lifelong study" (Houle, 1980, p. 7).

Continuing Professional Development

Continuing professional education or continuing professional development is important to society in general as it impacts the competence of practice. "The purpose of continuing professional education is to certify and improve professional knowledge and practice" (Sleezer, Conti, & Nolan, 2004, p. 21). People would not want to undergo surgery if the surgeon had not updated surgical skills and knowledge over the previous 10 years. Although there is no universal definition of a "profession," professionals are described as:

> Men and women deeply versed in advanced and
> subtle bodies of knowledge, which they apply
> with dedication in solving complex practical
> problems. They learn by study, apprenticeship,
> and experience, both by expanding their
> comprehension of formal disciplines and by
> finding new ways to use them to achieve specific
> ends, constantly moving forward and backward
> from theory to practice so that each enriches
> the other. Such people protect one another
> and are sometimes extended special protection
> by society far beyond that granted to other
> citizens. The price of protection is vigilance
> against poor performance and unethical behavior,
> and that vigilance is exercised by the
> privileged person, by others of similar
> specialization, and by society. (Houle, 1980,
> p. 1)

The process by which people become professionals is described as: (1) people select an occupation to pursue, (2) participate in formal education or training, and then (3) are accepted into a program of study of more specified and difficult skills related to the occupation, including a value system (Houle, 1980, p. 3). Participation in the process results in gradual acculturation into the profession which is evidenced by life-style changes, attitudes, and outlooks that characterize the occupation of choice. Next, people who enter a profession (4) are assessed for competency, (5) provided supervision by fellow members of the practice to strengthen and refine skills, and finally (6) establish the practice (pp. 2-3). Study at (6) occurs until retirement or death (p. 3). Once professional practice is established, the need to keep current with skill and knowledge development is frequently required by professional membership in an association, by the state, the government, and society in general to "maintain the credibility of the profession and to benefit society" (Sleezer, Conti, & Nolan, 2004, p. 22).

In American society today, millions of adults are considered to be professionals. Members of each profession have experienced a similar form of initial education of a substantial amount of specialized and scientific knowledge

with practice in applying the knowledge. This initial

regimented education process is referred to as technical

rationality (Cervero, 1988, p. 42; Schon, 1983, pp. 21-25).

As adults develop and grow in their profession, their

vision and range of practice continue to develop, and they

become more specialized in what they do (Stolovitch, Keeps,

& Rodrigue, 1999, p. 653). It is during this time that

some professionals develop their own unique professional

artistry that enables their practice to thrive. The model

of Reflective Practice describes the development of

professional artistry through the ability to reflect

(Schon, 1983).

<u>The Reflective Practitioner</u>

Reflective Practice describes the basic process of

ordinary practical knowledge or "knowing-in-action" as:

1. Professionals know how to carry out
   certain actions and judgments without
   thinking about them prior to or during
   performance.
2. Professionals are not aware of having
   learned to do these things.
3. Professionals are unable to describe the
   knowledge that the action reveals. (Schon,
   1983, p. 54)

However, problems arise that do not have ready

solutions and do not follow the rules and theories taught

during the time of initial education. Finding the best

solution is critical to the professional who wants to

retain credibility. These situations are described as full of instability and uncertainty during which the professional may use two processes of professional artistry described as "reflection-*in*-action" and "reflection-*on*-action" (Schon, 1983, 1987). These reflective processes are perhaps the "one kind of learning that is totally dependent upon achieving adulthood" (Brookfield, 1996, p. 376). The ability to reflect is critical as it impacts professional competency, authority, problem solving abilities, and contributes to personal expertise (Schon, 1983). Recent research on learning points to the ability to reflect as more crucial than age or experience in the development of expertise (Arlin, 1999; Collinson, 1999; Daley, 1999; Dunn & Shriner, 1999; Marchant, 2001).

"Reflection-*in*-action" is compared to "thinking on one's feet" and "keeping your wits about you" during an uncertain event (Schon, 1983, p. 54). "Reflection-*on*-action" occurs after the event when there is an opportunity to fully focus on analysis of the problem and possible solutions without having to act immediately (Schon, 1983, 1987). There is time to solicit advice from others and to formulate a plan for future action. Both processes, based upon reflection on professional knowledge and prior

experience, involve asking critical questions about an unexpected problem occurrence.

Asking critical questions about the unfamiliar event leads to experimentation with possible solutions (Schon, 1983). In order to find a solution to the problem situation, the problem must be "framed" or identified (Schon, 1983). The manner in which the problem is "framed" is based in the attitude towards the problem and in prior experiences. People have a "repertoire of examples, understandings, images, and actions from their experiences, and when a problem is framed, it may be seen as something already present in the repertoire, or as something unique" (Schon, 1983, p. 138). If the problem is already in a person's repertoire, there is likely to also be a solution in the repertoire and the problem is quickly resolved. If the problem is unfamiliar or unique, people must be willing to tolerate some uncertainty and confusion while the problem is solved through experimentation.

Experimentation involves three methods: exploratory experimentation to "get a feel for" the situation, "move-testing" experiments in which action is taken to effect a change, and hypothesis testing to determine action effectiveness (Schon, 1983, p. 145). All three experimental methods are fulfilled by the same

"experimenting-in-practice" actions (p. 147). If no solution is found, the problem is re-framed and a new experiment occurs. Reflection is a dynamic process professionals do naturally and intuitively.

However, professionals are not always able to communicate to others exactly how they reflect, perhaps not having frequent opportunities to communicate about their reflection processes to others, or not knowing how to analyze and explain what they do (Schon, 1983). For example, "while educating subordinates is one of a manager's most important functions, managers may experience difficulty in articulating reflective skills to subordinates" (p. 243). With the emphasis today on participation in a global economy, the ability to transmit knowledge is a prominent need (Stolovitch & Keeps, 1999). Knowledge itself increases evermore rapidly and it is difficult to keep abreast of new research and learning. There is also the possibility in some situations that finding solutions requires assistance and learning from outside the organization.

Other research on reflection has identified techniques to help stimulate the reflective process: examining practice; identifying problems; exploring alternatives;

theorizing and hypothesizing; consulting others; testing new techniques (Peters, 1991; Roth, 1989). It is suggested that continuing professional development should include reflection on professional practice (Schon, 1987, p. 321), and that reflection must become a specified part of professional and continuing education (Cervero, 1988, p. 46). Designers of professional development programs are listening to these suggestions and are working to determine which models are most effective to meet educators' learning needs.

<div align="center">Professional Development in Education</div>

Beginning in the 20th century, America's workforce adopted continuing professional education, also known as continuing professional development, to provide an opportunity for professionals to update their knowledge and skills (Cervero, 2001). Professionals are described as teachers, physicians, managers, clergy, and others:

> These professions teach our children, guide our
> business, manage and account for our money,
> settle our civil disputes, diagnose and treat
> our mental and physical ills, fight our wars,
> and help mediate our relationships with God.
> (Cervero, 2000, p. 3)

Continuing professional development is important to society because of the impact upon the on-going learning and competence of professional practice. Professional

development is rooted in the field of Adult Education and in the theories of Houle, Knowles, and Cervero (Sleezer, Conti, & Nolan, 2004, p. 23) and has the goal of developing reflective practitioners (Daley, 2003; Schon, 1983). The goal of professional development in the field of education is to effect "change in the classroom practices of teachers, in their attitudes and beliefs, and in the learning outcomes of students" (Guskey, 2002, p. 750). However, "very little of the knowledge base within the field of adult and continuing education or the research in professional learning has been incorporated into the analysis and development of teacher professional development programs" (Daley, 2003, p. 2).

The teaching profession is one that mandated professional development in order to "improve the practices of teachers" (Cervero, 2001, p. 16). The State of Oklahoma requires teacher participation in continuing professional development in order for teachers to retain licensure to teach. Professional development is defined as programs that provide additional education experiences for teachers, administrators, and other school employees (National Staff Development Council, 2003). Education is a field that is constantly changing as new knowledge about teaching and learning is discovered (Guskey & Huberman, 1995), and

changes occur in personal, societal, and governmental expectations (Fessler, 1995). Professional development for teachers is even more under the microscope today due to the focus on student achievement and accountability. The expectation is that professional development "should assist teachers in meeting the national performance standards" (Daley, 2003, p. 1). However, research reveals more about what does not work than what is effective professional development (Guskey, 1995).

Teaching

Teaching is complex. Teaching requires certain knowledge and skills. Two knowledge bases form the foundation of teaching (Eraut, 1995). One base stems from university level subject-matter learning, and the other from education-related processes, including pedagogy or the knowledge of childhood learning. Pedagogy includes teachers' knowledge and beliefs about effective teaching, learning, instructional strategies, and classroom management techniques that facilitate learning (Borko & Putnam, 1995).

The knowledge of pedagogy supports teaching as a profession (Eraut, 1995). It is the relationship between teachers and students that "comes closest to the idea of expert professionals determining the needs of their

clients" (p. 228), impacting what teachers do in the

classroom. Teacher knowledge is further detailed as

knowledge of:

> Subject-matter; education theory and practices;
> societal and citizenship; classroom "know how;"
> classroom-related theory more easily described
> than applied; management for experienced educators;
> other professional knowledge, such as curriculum
> development, counseling, and communication with
> parents. (Eraut, 1995, pp. 234-235)

Although teachers have so many "ways of knowing" about

teaching, they may not know how to apply the knowledge in

the classroom. Teachers learn a subject in pre-teaching

university programs, but "that does not prepare them to

structure, sequence, or pace their lessons, to recognize

potential in pupils' questions, and to understand the

nature of pupil misconceptions" (Eraut, 1995, p. 236). In

order for teachers to meet student learning needs, they

must understand the needs, have adequate knowledge of

teaching approaches, strategies, and activities, and be

able to organize and monitor those simultaneously (p. 229).

Proficient teachers restructure their knowledge into a

useful classroom format called "working knowledge", but

those who have developed little working knowledge find new

learning more difficult to integrate into classroom

practice (Eraut, 1995, pp. 235-236). The National Center

for Educational Statistics (1998) found that although 90%

of teachers participated in professional development for an average of 42 hours during the academic year, only 20% of teachers believed they were well enough prepared to implement technology into their instruction or to teach students of limited English (Sparks & Hirsh, 2000, p. 5).

This broad scope of required and changing teaching knowledge, the national standards requirements, societal expectations, and other influencing factors such as teacher age, amount of experience and whether the teacher is a novice or an expert teacher, and life and career stages of teachers (Daley, 1999; Fessler, 1995; Mevarech, 1995) have sparked contrasting opinions as to what format effective professional development for teachers should take (Guskey & Huberman, 1995). The conflicting viewpoints expressed are that effective professional development should:

> (1) Be teacher and classroom specific,
> implemented by individual teachers;
> (2) Be specific to the organization since
> individual teachers and schools do not
> have a broad vision;
> (3) Require greater change in teaching and
> more effort on the part of teachers as
> it is more likely the program will be
> implemented;
> (4) Require change to be gradual since when
> too much is expected of teachers at one
> time, programs fail. (Guskey & Huberman,
> 1995, p. 2)

A system of what works in educational professional development is difficult to determine not only because of

conflicting viewpoints of what effective professional

development should look like, but because "professions are

in a transitional stage, experimenting with many different

purposes, forms, and institutional locations for the

delivery of continuing education" (Cervero, 2000, p. 4).

There are also other issues involved, such as continuity

between programs, funding, and available time during the

school day for professional development.

Continuing Professional Education

Historically, most professional development has

consisted of a one-to-three day lecture or didactic, non-

collaborative experience that does not coordinate with

other professional development programs or relate to

classroom experiences, and is considered ineffective in

improving practice (Cervero, 2000, p. 4; Sparks & Hirsh,

2000, p. 5). Although General Electric, Arthur Anderson,

AT&T, and other employers spend upwards of 6.5% of their

revenues on employee professional development (Cervero,

2000, p. 5), American schools spend only 0.05% of their

budgets for teacher professional development (Sparks &

Hirsch, 2000, p. 12). The National Staff Development

Council suggests that school districts increase their

professional development budgets to 10% of the total school

budget, made possible by states "reducing their control and

monitoring functions since better-trained teachers would require less oversight" (Sparks & Hirsch, 2000, p. 12). Perhaps the most significant issue for teachers is lack of time for professional development, and lack of time to implement a new program (The Southeast Center for Teaching Quality, 2001).

Usually there is no time for teacher professional development during the school day and little time for teacher collaboration because they are busy with non-academic responsibilities. "There is no professional reason for teachers to spend time as hall monitors, detention guards, and lunchroom patrollers when they can be using that time for learning" (Sparks & Hirsch, 2000, p. 15). The 1993-94 Schools and Staffing Survey revealed only 47% of teachers reported receiving release time to attend professional development, and 23% said no support, time, or credit for professional development was provided to them (National Center for Education Statistics (NCES), 1998). In a related time and support issue for new teachers entering the teaching profession, only 19% had a mentor teacher, and only 33% participated in a formal entry-year program during their first year (NCES, 1999b). Due to the shortage of time during the school day for professional development, between 60% and 80% of professional

development programs are less than eight hours in duration and do not produce much effect (Sparks & Hirsch, 2000).

Effective professional development that effects change must include time to develop the knowledge of new information, to share experiences with colleagues, to adapt plans and activities, to apply the knowledge in the classroom, and to evaluate the impact on student learning (Guskey, 1995). "Neither clarity of practical understanding nor appreciation of the significance of an innovation fully develop until teachers have gained some experience in trying it out in their own classrooms" (Eraut, 1995, p. 249). In addition, many unforeseen problems can arise when implementing new programs (Guskey, 1995). For example, a new group of students arrive in teachers' classrooms every fall, requiring extra time to teach classroom management procedures, time to get to know each student and motivate them to learn, and time to teach the required subject matter(s). These processes do not include time to take attendance or to answer student questions. The implementation of a new program or curriculum can be challenging when the effects of change are unknown, when there is no time for teacher collaboration during the school day, and when facing the regular demands of day-to-day teaching. The National Staff

Development Council (2000) recommends "states and districts increase to 25% the time available during the school day for teachers to work together and collaboratively plan lessons and share information" (Sparks & Hirsch, p. 15).

Reflective Learning

Effective professional development assists teachers in gaining information to enlarge their repertoires to meet students' learning needs, and provides opportunities to learn from experience, reflecting, and theorizing about how to effectively improve student learning (Eraut, 1995). Adapting the information to the individual teacher's knowledge structure in order to fully implement and integrate new skills into practice requires time and support from others (p. 247). Support is most effective when provided from within the school rather than from outside sources (p. 249). Ongoing support for continuation and implementation is crucial and allows for encouragement, assistance in times of failure, discussion with colleagues and mentors, and for reflection on practice.

It is crucial to recognize that the change "that holds great promise for increasing individuals' competence or enhancing an organization's effectiveness is likely to be slow and require extra work" (Guskey, 1995, p. 123). Professional development should be seen as a process and

not a one day experience. In order for new knowledge and

skills to become a natural part of teachers' repertoires,

continued support and encouragement are essential (p. 124).

Models of professional development for teachers that

have been judged effective include those that have follow-

up activities in the form of long-term support, coaching

within the classroom, and interactions with colleagues

(Pritchard & Marshall, 2002). Effective professional

development also includes:

> A focus on subject matter and student knowledge;
> participant involvement in planning; emphasis
> on teacher responsibility in areas of self-
> instruction, peer work, collaborative efforts,
> and problem based learning; reliance on local
> expertise within the school for designing and
> conducting of professional development; and on
> providing support. (p. 118)

Teachers are attracted to professional development that

"expands their knowledge and skills, contributes to their

growth, and enhances their effectiveness with students"

(Guskey, 2002, p. 382). When professional development

contains these elements and is a part of the curriculum, it

forms a "holistic system of professional development for

all educators," and teachers are anxious and excited to

participate without further incentive (Pritchard &

Marshall, 2002, p. 115).

Effective professional development provides environments that are intellectually stimulating, are locally available, provide time for collaboration with colleagues, and concentrate on curriculum and instruction improvements ((Pritchard & Marshall, 2000). Effective professional development can help educators advance a vision of providing high quality learning experiences for students, and requires a shared vision with many forms of delivery such as study groups, expert delivery, action research, mentoring, and peer coaching (p. 136). An important factor in this type of successful professional development is the resultant change in teachers' attitudes, beliefs, and perceptions, which are believed to lead to improved student learning (Guskey, 2002).

Research with 18 elementary, middle, and high school teachers found that effective professional development for teachers includes:

> Having a constructivist orientation with an inquiry approach so that integration of knowledge, teaching practice, and context will occur; including action learning approaches where cases from teachers' actual practices are used; adjusting professional development with current changes, mandates, and educational reforms; maintaining a balance between educational theory and practical classroom issues, rather than focusing totally on one or the other perspective. (Daley, 2003, pp. 13-14)

Within the constructivist framework are activities that
integrate thinking, feeling, and acting on new concepts,
when teachers learn by "deeply probing their experiences
and developing an understanding of how those experiences
shaped their understanding of new concepts" (pp. 2-3). As
teachers reflect on events in their practices, they reflect
on their own beliefs and assumptions about their roles as
teachers.

As knowledge increases, new expertise is required of
teachers at all levels. Effective professional development
assists professionals in "critically analyzing, acquiring,
practicing, and developing new knowledge and skills"
(Anderson & Kanuka, 1997, p. 4). According to Livneh &
Livneh (1999, p. 92) continuing professional development
"can no longer be seen as educators leaving their buildings
to attend short workshops or graduate courses." It must
change to include opportunities for educators to:

    (1) Reflect on their practice and solve
        problems of practice collaboratively;
    (2) Dialogue with colleagues;
    (3) Develop a school culture that supports
        collaborative action versus individual
        development;
    (4) Be based in actual work with students;
    (5) Involve peer observations, coaching and
        feedback;
    (6) Be ongoing for the length of their career.
        (p. 92)

As professional development programs implement research guidelines, programs for teachers will be more powerful and more effective. Teachers will believe they are able to teach effectively, that they can reach all of their students, and that their teaching has a powerful impact on improving student learning. Those beliefs in their ability to impact student learning teach are identified as "self-efficacy."

Social Cognitive Theory

The theoretical foundation for self-efficacy research is provided through Social Cognitive Theory (Bandura, 1977, 1986, 1993, 1997). Social Learning Theory, which suggests that people learn by observing and imitating others (Merriam & Caffarella, 1999), was expanded upon and in 1977 Bandura added the construct of self-efficacy. Between 1977 and 1986 Bandura published 4 articles and contributed a book chapter on self-efficacy and perceived self-efficacy (1977, 1978, 1982, 1983, 1984). Self-efficacy "refers to beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 2). Self-efficacy is people's judgment of their capability to complete a task or variety of tasks, without which people would have no reason to act. Lives

are directed by self-efficacy beliefs (Bandura, 1997;

Maddux, 1995).

Self-Efficacy

Self-efficacy, that "can-do" belief, is an integral part of human existence as people seek ways to bring about desired outcomes in their lives, even from very early childhood. For example, the baby sitting in a high chair repeatedly drops a toy while the parent picks it up and hands it back to the child. For as long as the adult is willing to play the game, the child experiences and learns the results of the act of deliberate toy-dropping. That intentional effort to act to cause something to happen is called "human agency, referring to acts done intentionally" (p. 3). "The core features of agency enable people to play a part in their self-development, adaptation, and self-renewal with changing times" (p. 2). Human agency is affected by self-efficacy beliefs, affecting how people think, act, feel, and self-motivate (Bandura, 1997). Beliefs in the ability to act, to complete a task or to do the job, are essential to human performance and existence. Those beliefs impact people's choices, effort, persistence through challenges and difficulties, and affect the goals people set for themselves and situations in which people find themselves (Bandura, 1994; Maddux, 1995).

Bandura (1986) added "Cognitive" to Social Theory to
address human cognition or the processes of vicarious
thought, self-reflection, self-monitoring, symbolization,
and forethought. These are personal agency factors in
addition to the behavioral and environmental factors that
affect human functioning. Cognition was added to the
behavioral and environmental processes to better account
for the effect of people's agency or their intentional
actions that produce outcomes in their lives. Those
actions are influenced by people's self-efficacy, their
"judgments of their capabilities to organize and execute
courses of action required to attain designated types of
performances" (Bandura, 1986, p. 391). According to Social
Cognitive Theory people are affected by the interaction of
behavioral factors, environmental factors, and personal
factors (Bandura, 1997; Merriam & Caffarella, 1999;
Pajares, 2002b). In the process of determining the impact
on human functioning, self-efficacy is often linked with
other concepts such as expectancy, motivation, and locus of
control. Twenty-five years of research have helped to
clarify the construct of self-efficacy, especially that of
teachers' self-efficacy.

Self-efficacy has often been used interchangeably with
perceived self-efficacy, self-confidence, motivation, locus

of control, self-esteem, and other terms (Skinner, 1996).

While being synonymous with "perceived self-efficacy" (F.

Pajares, personal communication, November 25, 2003), self-

efficacy differs from self-confidence in that "confidence

refers to strength of belief but does not necessarily

specify what the certainty is about" (Bandura, 1997, p.

382). Motivation involves people's attainment of goals (p.

228). "Beliefs about whether actions affect outcomes"

defines locus of control, which is also "a weak predictor

of transference of behaviors across situations" (Bandura,

1997, p. 20). Self-esteem is an estimate of one's self-

worth (p. 11). Liking one's self and feeling confident are

insufficient to thoroughly impact feelings, actions,

thoughts, and self-motivation in contrast to self-efficacy

beliefs.

Self-efficacy affects all aspects of people's lives:

the effort expended to exercise while avoiding smoking and

other unhealthful habits; the suffering of anxiety,

depression, and eating disorders; practicing to develop

musical, athletic, and other performance-based skills; and

career selection and occupational performance (Bandura,

1997). "People's level of motivation, affective states,

and actions are based more on what they believe than on

what is objectively true" (Bandura, 1997, p. 2). In other

words, people's goals, feelings, and actions are based more on their self-efficacy beliefs than on fact or what is real. Students with strong self-efficacy beliefs may continue to work on an assignment even though their skills are actually weak in that area. Social reformers, innovators (Bandura, 1997), and political figures have strong self-efficacy beliefs to face obstacles and public criticism. People's actions, feelings, thoughts, and motivation are influenced by their self-efficacy beliefs (Bandura, 1997). It is important to know how those beliefs come about. How self-efficacy beliefs are produced and measured is described next.

Self-Efficacy Beliefs

Self-efficacy beliefs are *derived* from the sources of mastery experience, vicarious experience, social and verbal persuasion, and physiological states (Bandura, 1986). Self-efficacy beliefs are *measured* in terms of level, generality, and strength (Bandura, 1997). The influencing *processes* of self-efficacy are those of cognition, motivation, affect, and selection. Those four processes share several common components, among which are forethought or planning ahead, self-regulation, and self-reflection (Bandura, 1997).

Sources of Self-Efficacy Beliefs

There are four sources of self-efficacy beliefs: (1) mastery experience, (2) vicarious experience, (3) physiological states, and (4) social persuasion. "Mastery" experiences are those that are successful and raise self-efficacy beliefs so that, "once established, they transfer to other situations" (Bandura, 1986, p. 399). For example, spelling words successfully enough to pass a spelling test with no errors would carry over to a math facts test where similar results would be expected. Through "vicarious" experiences, self-efficacy beliefs are formed by the success or failure of others judged by the observer to be of similar ability (p. 399). Students compare themselves with other students and will attempt a task, expecting to be successful, if a classmate with like capabilities successfully completes the same task. People's physical reactions or "physiological states" in various situations provides self-efficacy information, such as speaking before large crowds causing stress and "butterflies" for some people. With experience and success, the stress and nervousness gradually decrease. "Social persuasion" contributes to the formation of self-efficacy beliefs if the "heightened appraisal is realistic" (Bandura, 1986, p. 400). Students praised by the teacher will form stronger

self-efficacy beliefs about their capabilities to complete the task if the praise is judged to be authentic and reasonable. "A self-efficacy assessment, therefore, includes both an affirmation of a capability level and the strength of that belief" (Bandura, 1997, p. 382).

Self-efficacy can differ across circumstances in three ways: level, generality, and strength (Bandura, 1997; Zimmerman, 2000). The student's computation of increasingly difficult math problems affects the "level" of self-efficacy beliefs. "Generality" of self-efficacy refers to transference across various situations, as in the teacher believing in the capability to teaching English Composition as effectively as teaching Advanced Placement Chemistry. "Strength" of self-efficacy is the degree of competence for performing a particular task. Strength is often expressed in terms of having high or low self-efficacy. These beliefs of self-efficacy are in turn influenced by four processes.

Self-efficacy beliefs both influence and are influenced by the interactions of people's thoughts or cognitive processes with their motivational processes, with their emotions or affective processes, and with their choices or selection processes. These four processes act as "moderators" or "regulators" of the afore-mentioned

physiological states, social persuasion, vicarious, and mastery experiences that form peoples' self-efficacy beliefs (Bandura, 1997). Among the common components shared by these processes are: (a) forethought or the capability to plan, (b) self-regulation, and (c) self-reflection.

Forethought considers possible results of future actions and involves planning ahead (Bandura, 1997). Forethought contributes to human functioning, for example, as people consider consequences of future actions and how those might be perceived by others, and whether or not those consequences would be rewarding. Forethought helps people maintain control of their environment as they plan ahead at home, in school, and in their careers to set personal goals, anticipate outcomes, and to problem-solve. Forethought interacts with self-regulation in decision-making and other areas (Bandura, 1997).

Self-regulation enables people to monitor and adjust their thoughts and actions, and to control them. Self-observation and self-monitoring skills affect people's self-regulation abilities (Levine & Reed, 1998; Pajares, 2002a). For example, strong skills in self-regulation permit students to focus on instruction rather than on activities outside the window, to continue working, and to

proof-read their work before turning it in. Self-regulation allows people to be aware of others' responses to them, to inhibit unpleasant actions, to determine personal goals, incentives, and amount of motivation and effort expended on a task (Bandura, 1997).

Self-reflection is defined as self-observation and self-judgment of thoughts, actions, feelings, and motivations for accuracy (Bandura, 1997) and is the most "distinctly human" ability (Bandura, 1986, p. 21). It is the ability of people to think back on experiences, choices, and decisions, and to evaluate them. People regulate their actions or performance, evaluate and plan solutions, and are able to change behaviors and thinking through self-reflection. "Efficacy beliefs are structured by experience and reflective thought rather than being simply a disjoined collection of highly specific self-beliefs" (Bandura, 1997, p. 51). Social Cognitive Theory provides the theoretical foundation for the analysis of teachers' self-efficacy in this study. Research over the past 28 years has demonstrated that teachers' efficacy consistently relates to teaching and learning, and that teachers may be the most important factor in the classroom (Soodak & Podell, 1993; Tschannen-Moran & Woolfolk Hoy, 2001).

Teacher Self-Efficacy

The formation of teacher self-efficacy beliefs is complex. Forming these beliefs involves the analysis of the teaching tasks, reflection upon the effort expended, the impact on student learning, and applicable past experiences, students, and teaching tools available. Teachers then make judgments about their competence as teachers (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). Research over the past 28 years has demonstrated that teacher efficacy is "powerfully related to many meaningful educational outcomes such as teachers' persistence, enthusiasm, commitment and instructional behavior, as well as student outcomes such as achievement, motivation and self-efficacy beliefs" (Tschannen-Moran & Woolfolk Hoy, 2001, p. 783).

Teacher-efficacy research is based in two theories: (1) Locus of Control Theory (Rotter, 1966) and (2) Social Learning Theory (Bandura 1977, 1982, 1986, 1993, 1997). These two theoretical branches have led to the development of several measures in the attempt to illuminate the concept of teacher self-efficacy and to effectively measure it. For Bandura (1997), self-efficacy is different from and is a stronger predictor of behavior than locus of control. Locus of control involves people's beliefs that

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their actions can influence results. Self-efficacy is
about people's beliefs in their competence to "do the job"
(p. 3). Teacher efficacy refers to teachers' beliefs that
they can influence student learning, and to their personal
beliefs about capabilities to help students learn (Ashton &
Webb, 1986; Gibson & Dembo, 1984; Guskey & Passaro, 1994;
Tschannen-Moran & Woolfolk Hoy, 1998, 2001).

Teacher self-efficacy research also stems from the
RAND study of urban school district teachers believing they
could control the reinforcement of their actions rather
than the environment controlling reinforcement (Armor,
Conroy-Oseguera, Cox, King, McDonnell, Pascal, et al.,
1976). The researchers assessed what is now called General
Teaching Efficacy (GTE) and Personal Teaching Efficacy
(PTE) (Tschannen-Moran & Woolfolk-Hoy, 2001). General
teaching efficacy targets the belief that teachers in
general are unable to overcome the student environmental
factors of socio-economic status, race, gender, and others
that influence student achievement. Personal teaching
efficacy applies to the individual teacher and taps beliefs
in individual training, competence, and the ability to
improve student achievement by overcoming environmental
factors.

The two RAND questions about teacher efficacy were based upon Rotter's (1966) Locus of Control theory, and were: (1) "When it comes right down to it, a teacher really can't do much because a student's motivation and performance depend on his or her home environment (General Teaching Efficacy);" and (2) "If I try really hard, I can get through to even the most difficult or unmotivated students (Personal Teaching Efficacy)." Teachers who had an external locus of control believed that student environmental factors have more influence on student learning. Teachers with an internal locus of control believed they could overcome environmental factors and improve student learning. The combined scores of the two questions was called "teacher efficacy", the belief in internal control and that the teacher controlled student learning. This study found a significant positive relationship exists between teacher efficacy and student achievement.

Teacher "expectancy outcomes" were studied in the 1968 "Pygmalion in the Classroom" research when teachers' high expectations of student ability became reality (Rosenthal & Jacobson, 1992). Teachers were provided a list of randomly selected students and were advised to expect those students to demonstrate intellectual growth during the school year.

At the end of the year, those particular students did show

significant gains in intellectual growth compared to those

in the control group. Later, teacher expectancy was

combined with "teacher sense of efficacy" in a model of

teaching and student learning that demonstrated the

effectiveness of teacher expectations on student

achievement (Proctor, 1984). Teacher expectancy may be

confused with teacher self-efficacy. Expectancy concerns

teachers' expectations for their students, not for teacher

self-efficacy or beliefs in the teachers' level of

competence to teach. Work on the development of more

accurate measurements continued.

Rose and Medway (1981) developed the Teacher Locus of

Control instrument to determine the responsibility for

student learning. The 28 items on this survey required

teachers to select one of two explanations for situations

described in each item. One explanation attributed student

success to the teacher, the other to environmental or

external factors. This study found high internal locus of

control teachers were less likely to respond to student

behavior with authoritarian remarks, and used more student-

directed activities in the learning process.

Guskey (1981) developed The Responsibility for Student

Achievement instrument to determine the amount of

responsibility the teacher assumed for student successes and failures. This study discovered teachers felt they had less influence and responsibility for student failures than for student successes. Guskey (1987) later suggested that student failures and successes influenced teacher self-efficacy. Overall, research stemming from the Locus of Control theory demonstrates teacher self-efficacy is related to student achievement (Armor et al., 1976; Ashton & Webb, 1986), teachers with high self-efficacy are more likely to implement new teaching methods (Guskey, 1984), are more positive in their discipline approaches (Ashton & Webb, 1986), and are more passionate and committed to teaching (Glickman & Tamashiro, 1982).

Gibson and Dembo (1984) developed the Teacher Efficacy Scale based upon the RAND items and Bandura's (1977) Social Cognitive definition of efficacy as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). In a study with 208 elementary teachers from 13 elementary schools, the researchers found that although low-efficacy teachers spent more time in small group instruction, they were less likely to monitor the entire class and keep students on task than high-efficacy teachers, and were more likely to go on to other questions or students rather than to use

questioning methods to develop student knowledge and higher order reasoning (Gibson & Dembo, 1984).

Through factor analysis, Guskey & Passaro (1994) later determined the factors on the Gibson & Dembo Teacher Efficacy Scale were mislabeled, but also established that there were two dimensions of self-efficacy. Other research also revealed inconsistencies with the Gibson & Dembo Scale, but a modified Scale continues to be used (Tschannen-Moran, Woolfolk-Hoy, & Hoy, 1998) to determine efficacy for teaching science and chemistry (Riggs & Enochs, 1990; Rubeck & Enochs, 1991), classroom management (Emmer & Hickman, 1990), and special education (Coladarci & Breton, 1997). Research using this scale found efficacy to be related to teacher use of praise and encouragement, willingness to spend more time with students who need individual help, referral of students for special education, and to student achievement (Soodak & Podell, 1993, 1996; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998).

Ashton & Webb (1986) surveyed, observed, and interviewed middle and high school teachers to develop a "conceptual framework for understanding teacher efficacy and to suggest further research directions" (p. vii). They examined the effect of teachers' efficacy on their students in three areas: (1) relationships with students, (2)

classroom management, and (3) instructional methods (p.

86). In general, high-efficacy teachers were found to be

friendly and trusting towards their students, experienced

less disruptive behavior in the classroom than their

counterparts, and kept students on task (Ashton & Webb,

1986). When correction was necessary, "remarks to students

tended to be firm, to the point, and without emotional

embellishments" such as:

- Move up a seat and stay there.
- I want to see you after class.
- Those of you at the door, please come
  back and sit down.
- If you don't listen you're going to miss this.
- Now who's whistling? Cut it out, you'll have
  all weekend to whistle. p. 79)

In contrast, teachers with low self-efficacy experienced

stress and strain in their relationships with students,

used humiliation as a behavior control method, neglected

struggling students, and were unable to inspire their

students to higher achievement (p. 86).

The Teacher Efficacy Scale (Gibson & Dembo, 1984) was

used in a study to determine the effect of self-efficacy on

teachers' judgments of appropriate classroom placement of

students with learning difficulties (Soodak & Podell,

1993).

Teachers who believe that their teaching
cannot influence student outcomes may decide

to refer a difficult-to-teach student to special education. Conversely, teachers who have a greater belief in their ability to effect change may be more willing to retain the difficult-to-teach student in regular education and to rely on their own resourcefulness to overcome student difficulties. (p. 67)

This study found that students who have both behavioral and learning difficulties are most likely to be referred for special education (Soodak & Podell, 1993, p. 76). These students are referred more often by regular education teachers who do not believe in their own capabilities to influence student learning and who believe students with difficulties should not be placed in the regular education classroom. When teachers believe their teaching impacts student learning, they are more likely to believe students with learning difficulties should remain in the regular education classroom (pp. 77-79).

Bandura (1997, 2001) found these earlier teachers' efficacy scales to be too general to accurately measure the many tasks involved in teaching (Tschannen-Moran, Woolfolk Hoy, 2001), and identified seven areas or categories of teacher efficacy:

- Decision-making;
- Acquisition and use of school resources;
- Teaching efficacy;
- Disciplinary matters;
- Enlisting parental assistance;

- Involving the community;
- Generating an open school climate.
  (Bandura, 1997)

The task of teaching includes numerous responsibilities and activities required of teachers. Three critical tasks of teaching are the ability to motivate and engage students, to manage their behaviors, and to use instructional strategies in a manner conducive to students becoming self-directed learners.

Student engagement involves developing the kinds of positive emotional relationships with students that are conducive to improving student interest, self-efficacy, and motivation, assisting struggling students, and providing educational support to parents (Bandura, 1997; Hargreaves, 2000). "Emotion, cognition and action, in fact, are integrally connected" (Hargreaves, 2000, p. 812). Elementary teachers may be able to more easily create a caring but not overindulgent relationship than secondary teachers, who maintain a more "professionally distanced" (p. 825) manner with their students.

Instructional strategies includes teachers' use of a variety of methods, materials, and media to provide a challenging learning environment to encourage higher-order cognition while adjusting instruction for the individual student by using a variety of assessments (Codone, 2001;

Levine, 2002a). Students do not understand and learn in

like manner, requiring teachers to analyze their

instruction in order to more effectively instruct students

in the use of various strategies. "Instructional studies

have substantiated the idea that teaching students to use

strategies raises self-efficacy and achievement" (Schunk,

1991, p. 215).

Classroom management includes the creation and

maintenance of a safe, orderly, and challenging learning

environment. This environment is supported by (1) an

engaging curriculum, (2) working with anger, projection,

and depression, (3) students as responsible citizens, (4)

the teacher as a self-knowing model, (5) classroom

management skills, (6) working with resistance, conflict,

and stress, and (7) robust instruction (Hanson, 1998).

Research shows teachers who doubt they can control the

classroom do less to control student behaviors while

blaming the students (Bandura, 1997; Browers & Tomic,

2000). Such teachers "develop a negative attitude toward

their students" which can lead to teacher burnout (Browers

& Tomic, 2000, p. 249).

Strength of teacher efficacy can vary across these

responsibilities. Teacher efficacy is also influenced by

the actions of the school principal, who can create highly

efficacious teachers by obtaining resources for them, protecting them from disorder, allowing participation in school and district decision-making processes, and encouraging their performance (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). Teachers' beliefs in their school as a whole, or collective efficacy, is as predictive of school performance as individual teacher efficacy (Bandura, 1993; Goddard, Hoy, & Woolfolk Hoy, 2000; Hoy, Sweetland, & Smith, 2002). Teacher efficacy can be "caught by students, as highly efficacious teachers create students with high efficacy, and teachers with low self-efficacy create students with low self-efficacy, leading to lower student achievement, resulting in even lower teacher-efficacy" (Pajares, 2002a, p. 122).

Teachers' self-efficacy has been related to teachers' practice in the classroom (Ashton & Webb, 1986), to student achievement (Armor et al., 1976; Ashton & Webb, 1986), and to students' own sense of efficacy and achievement across various areas (Pajares, 2002a). Teachers' strength of self-efficacy affects the amount of effort they expend in teaching, their levels of aspiration, and the goals they set (Tschannen-Moran & Woolfolk Hoy, 2001). Teachers with strong or high self-efficacy are more open to new teaching methods and are more willing to try them in the classroom

(Guskey, 1988). These teachers are more understanding and less critical of their students (Ashton & Webb, 1986), and are willing to spend more time with students who need individual help (Gibson & Dembo, 1984). High self-efficacy teachers refer fewer students for special education (Soodak & Podell, 1993), are excited about teaching (Allinder, 1994; Guskey, 1984), and are less likely to suffer teacher burn-out (Brouwers & Tomic, 2000). The self-efficacy beliefs of teachers influence their own practice, students' self-efficacy, and student achievement (Ashton & Webb, 1986; Pajares, 2002a). Self-efficacy beliefs have a powerful effect on the performance of teachers and students. A professional development program that may impact educators' self-efficacy is Schools Attuned.

<div align="center">Schools Attuned</div>

Schools Attuned is a year-long professional development program for educators that draws upon over thirty years of research in specialized fields such as human development, neurology, and medicine. Levine and Reed (1998) state that this approach is necessary because approximately 15% to 20% of students are affected by "low-severity / high-prevalence" learning differences. These differences are "considered 'low-severity' in comparison to multiple handicaps or mental retardation, and 'high-

prevalence' because they affect many school children" (pp. 1-2). This situation is expressed as:

> Kids who can't seem to operate their minds to meet expectations feel terrible about themselves, while their perplexed parents understandably lose sleep over their child who reads with little understanding or has trouble making friends or is out of focus in school. Teachers may feel exasperated and sometimes incompetent as they witness a student's inexplicable downward spiral. (Levine, 2002a, p. 14)

Schools Attuned draws upon the learning theories of Adult Education and Constructivism (Merriam & Caffarella, 1999). The program was designed using professional development standards developed by the National Staff Development Council and current adult education research (AKOM, 2003a). Schools Attuned has a research base in various and specialized fields.

Schools Attuned combines research in the fields of human development, neurology, medicine, occupational therapy, language development, sociology, education, psychology, learning disabilities, and brain function to clarify the ways people find success or failure in various phases and areas of school (Levine & Reed, 1998). Experts in these fields such as Denckla (neurology), Chall and Moats (reading), Chomsky (linguistics), Gesell and Elkind (development), Frostig (visual perception and learning problems), Merzenich (brain functions), Pennington

(developmental neuropsychology), Shaywitz and Shaywitz (learning and attention,) and many others have contributed to the Schools Attuned research base.

Their contributions are significant because the interactions of human development and the central nervous system functions combine in a variety of ways within each individual to impact people's abilities. Whether people can live up to their potential is affected by their strengths and weaknesses. These strengths and weaknesses occur in the perceiving, processing, and retaining of various kinds of information which influence people's actions and interaction with others throughout their lives. People make sense of their lives through their perception and comprehension of information (Levine & Reed, 1998).

Years of research in each of those fields address effective instructional methods that impact learning. This is a large amount of information that is often slow to reach teachers in the classroom. Schools Attuned combines this information in a unique program that provides educators a method for more effective implementation. Traditionally, experts assist their clients or patients using only the techniques learned in their particular fields without overlapping into other areas (Levine & Reed, 1998). For example, the physician evaluates a patient

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using medical tests and medical terminology. If the tests reveal treatment from another field such as psychiatry is necessary, the physician refers the patient to a psychiatrist rather than further treating the patient. Schools Attuned is broadly based and provides research from many fields. It is flexible to keep pace with new research developments in those specialty areas. The program is constantly updated and new research information is available electronically to Schools Attuned participants.

With this model, Schools Attuned provides a way for teachers to think about students academically and socially (Levine in a conference address, 2003). The Schools Attuned model is based upon the conceptual framework of eight "Neurodevelopmental Constructs." These are widely accepted categories or constructs of abstract neurological and developmental functions (See Figure 1). The neurodevelopmental functions are defined as "basic abilities of the human mind representing neurological capacities in that they are mediated by the brain. They are developmental in that they are expected to become increasingly effective over time and with experience (i.e., practice)" (Levine & Reed, 1998, pp. 8-9). These functions interact and overlap as they impact people's behavior and performance (Levine & Reed, 1998).

These brain functions are grouped into categories or *constructs*, then into *functions*, some of which are further divided into *components* (not shown in Figure 1) and are printed on the "Table of Neurodevelopmental Constructs" to illustrate the constructs and functions for Schools Attuned teachers (Levine, 2000) (see Figure 1). These constructs and functions were selected for three reasons: (1) the various fields of research related to learning differences and reduced student production and achievement; (2) Levine's own explorations in this area; and (3) his diagnostic experience as a pediatrician (Levine & Reed, 1998, p. 12). "The constructs do not represent self-contained systems, but are influenced by, and by themselves influence, various constitutional and environmental forces, among which we can include the child's affect, temperament, physical health, self-esteem, cultural background, and motivation" (p. 13).

As an example of their organization, three *functions* impacting peoples' abilities to pay attention are grouped under the Attention Construct on the Table of Constructs: (1) Mental Energy Controls, (2) Processing Controls, and (3) Production Controls (see Figure 1). In turn, those functions are further delineated by their components. For example, the first function, Mental Energy Controls, has 4

components (not shown in Figure 1): (a) Alertness, (b) Mental Effort, (c) Sleep/Arousal Balance, and (d) Performance Consistency. This organization illustrates that people having difficulty paying attention could be affected by: (1) their level of alertness or sustaining enough energy to concentrate; (2) the amount of effort they are expending, whether interested or not, on the task at hand; (3) the amount of sleep they received the night before, all of which may result in (4) inconsistent performance from day to day and between different subject areas or assignment requirements (AKOM, 2000; Levine & Reed, 1998). The brain functions combine with and lap over each other so that people have their own individual wiring systems. However, there are general consistencies. Research demonstrates the strong connection between "attention and memory and between attention and sequential skills development," for example (Levine & Reed, 1998, p. 13).

Brain functions must come together at the same time and in the correct order for learning to smoothly occur. Underlying skills are first learned in increments, and then skills are formed as the neurodevelopmental functions interact. If students' skills are not forming correctly, the teacher must look at the underlying skills and the

various functions to find the breakdown point (Levine & Reed, 1998). Once possible impeding functions are determined, intervention and remediation can occur. Schools Attuned provides methods for teachers to observe and identify the impeding functions of learning, and to intervene (AKOM, 2000).

Schools Attuned uses a process of "management by profile" to observe, identify, and describe both strengths and weaknesses in student learning. The entire process is called "Attuning A Student" and is included in Schools Attuned program (AKOM, 2000). The management by profile process involves the student, parent, and teacher(s) completing their own questionnaires regarding the student's observable behaviors. The data from all three sources are compiled by the teacher to reveal a "profile" of the student's strengths and weaknesses. Teachers look for recurring themes and patterns to develop the student's profile in order to design a "management plan" for the student.

The profile enables the teacher to focus on the whole person rather than only the areas with which the student is struggling. The student's likes or "affinities", areas of interest, and what is strong and working well are all recognized. The acknowledgement of student strengths

provides affirmation of what the student does well. The

encouragement of student affinities supports and encourages

interests that can lead to the development of an area of

expertise for the student. According to Levine (2002a),

everyone needs an area of expertise.

Schools Attuned uses the management by profile to

describe the person rather than using labels. The

functions are described, not the student. As the keynote

speaker at a conference in Oklahoma (2003), Levine

explained that through this process, "No one receives a

label such as having 'Asperger's Syndrome' or being

'learning disabled,' thus avoiding student humiliation."

The learning profile is explained to the student and the

parent in a "demystification" meeting. Both strengths and

weaknesses are identified and hope for the future is

projected by the teacher. During the meeting, the

"mystery" of the student's strengths and weaknesses is

revealed. Instead of believing in stupidity as the cause

for a difficulty, there is the reality of the breakdown

point. Teacher, student, and parent become a team and

create a plan to implement accommodations and interventions

to manage the student's learning. Accommodations, such as

writing assignments on the computer, support the student in

temporarily working around the weak writing areas.

Interventions support the student as skills are strengthened, such as using math fact cards to memorize math facts.

As the student progresses through school, the plan is reevaluated and adjusted to meet the increasing demands of school. The entire process can be repeated every two or three years if desired. The constructs and functions can be explained to students by teachers through book studies and other activities. A whole class "attuning" is also possible with the supplementary curriculum in a classroom kit designed for fifth grade and beyond (Levine, Swartz, & Wakely, 1997). The activities in the kit are followed by class discussion where students' self-awareness and self-knowledge grow and strengthen. The students also learn that everyone learns in different ways, that it is acceptable to learn differently, and that it is possible to improve learning (Levine & Gardner, 2001).

Schools Attuned has powerful future application beyond the kindergarten through grade 12 years of schooling. College students often face learning difficulties for the first time because of their over-reliance on memory during earlier years of school (Levine & Reed, 1998). Skills have not been developed and learned in order to effectively comprehend, discuss, and write about the issues as required

in college coursework (Levine, 2003b; Smith, 1982). People would benefit by the early knowing of their preferences and passions in life to better select and prepare for future careers (Levine, 2003b). This kind of knowledge could improve worker and management relationships in every field of work. The Schools Attuned program could have far reaching effects on teaching and learning.

<div align="center">Adult Learning</div>

Schools Attuned participants are adults who are self-directed learners who choose to participate in professional development, specifically in a program that will help them solve the real-life problems they are experiencing in their classrooms. Schools Attuned also impacts student and parent learning through the teachers and Levine's books and materials. Schools Attuned focuses on the group and on the individual, on people's social and individual learning needs, to support and encourage self-directed and life-long learning for all (Levine & Reed, 1998; Levine, 2002a).

Constructivism considers people's prior experiences, knowledge, and learning processes. Although learning differences are not categorized as "learning styles" in Schools Attuned, participating teachers learn to recognize differences in individual learning processes. Through activities, teachers practice identifying ways in which

these differences can manifest in the classroom, and practice finding strategies to meet individual learning needs. They discuss problems and solutions with their colleagues, and take time to reflect on their practices.

The influence of Constructivism is represented by the Schools Attuned process of "demystification." This is a process of people coming to understand themselves and their learning processes through "accurate personal insight developed by open discussion with others to put borders around their deficits" (Levine & Reed, 1998, p. 283). Through demystification, people come to realize they have strengths and weaknesses, as does everyone, which may strengthen their self-efficacy. Their locus of control beliefs may change from external to internal focus. Externally-focused people believe they have no control of their learning, that their lack of achievement is due to their stupidity or is the fault of the teacher. People who are internally-focused believe their difficulties are due to their own learning differences, and are often more willing to request and receive learning support and assistance (Merriam & Caffarella, 1999).

Constructivists focus on how people make sense or meaning of an experience through social interaction and reflection, resulting in the construction of new ideas

influenced by past knowledge and experiences (Merriam & Caffarella, 1999). The Schools Attuned supplementary materials for students are drawn from the Constructivist model. Students experience the constructs and functions through whole class learning activities, reflect, and then discuss their experiences. This is a more powerful way for students to learn about learning than by using a lecture format and this allows for interaction between individuals and groups.

The Schools Attuned professional development program for educators also uses learning activities instead of a lecture format. Participating teachers experience learning differences through a variety of activities, including role plays and various ways to group students by teachers, which demonstrate both learning strengths and weaknesses. Educators come to understand the learning differences experienced by others, and also learn about their own ways of learning. Self-reflection and discussion by the participants are a major component of Schools Attuned. Many teachers express that Schools Attuned has changed the way they view their students.

Schools Attuned incorporates two crucial factors of professional development: (1) "what motivates teachers to engage in professional development, and (2) the process by

which change in teachers typically occurs" (Guskey, 2002, p. 282). Teachers participate in professional development not only because they are required to do so, but because of their desire to help their students learn. As adults, teachers seek solutions to real-life problems, and those problems revolve around student learning. When all of the "teaching tools" they possess are ineffective, teachers eagerly search for effective methods to manage student learning. Having ineffective methods reflects poorly upon teachers' practice and upon their evaluations of themselves as teachers, resulting in the development of low teacher self-efficacy.

Schools Attuned is promoted as a program that provides unique tools for understanding and managing student learning, increasing teachers' knowledge of student learning characteristics, improving teachers' skills in identifying strengths and weaknesses, and in providing appropriate interventions. Theoretically, practicing these skills coupled with discussion and reflection activities as part of the Schools Attuned Course should make a positive difference in teacher self-efficacy. Although the Schools Attuned program is available in Oklahoma, little is known about the effects of participation in Schools Attuned. This study is an attempt to discover what impact Schools

Attuned may have on four dimensions of teacher self-efficacy.

CHAPTER III

METHODOLOGY

<u>Design</u>

This study utilized a quasi-experimental repeated
measures time-series design with a control group. The
quasi-experimental design is utilized when randomization of
subjects to treatment and control groups is not possible,
forming two nonequivalent groups (Gay & Airasian, 2000).
The time-series repeated measures design is similar to a
pretest-posttest design but repeatedly tests the
participants with the same measure (Gay & Airasian, 2000).
Repeated measures designs allow participants to serve as
their own control as the measure is administered several
times to the participants. Repeated measures designs
examine change in growth and learning, minimizing the
variance effects of individual differences by comparing
changes in the experimental group with changes in the
control group. Because of this ability to separate the
effects of the independent variable, repeated measures
designs are statistically powerful and more sensitive than

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many other methods (Arundale, 1977). Repeated measures

designs are susceptible to threats to internal validity;

however, the addition of a control group controlled for all

threats to internal validity (Gay & Airasian, 2000, p.

422). Threats to internal and external validity of this

study were evaluated.

Threats to Internal Validity

Internal validity indicates the extent to which the

study results are due to the independent variable rather

than some other variable or factor (Gay & Airasian, 2000).

There are seven threats to internal validity: history,

maturation, testing, instrumentation, regression,

selection, and mortality. History refers to general events

that are not part of the study but which affect the

outcomes. The longer the study, the more likely it will be

affected by history. No events occurred during this study

that may have affected the outcomes.

The second threat of maturation refers to natural

changes to the participants occurring during the study that

may affect their performance. Natural changes include

participant boredom and decreased motivation which can

affect performance. The third thread of testing refers to

improved post-test scores as a result of having taken the

pretest, particularly if the study involves recalling

declarative knowledge or facts. Both maturation and testing were controlled in this study because of the addition of a control group and the threats would appear equally in both groups.

The fourth threat of instrumentation refers to unreliability or lack of consistency in the measurement used in the study. Threat to instrumentation is eliminated by using the same measuring instrument and administering it the same way (Mitchell & Jolley, 1988, p. 247). In addition, the primary measure used in this study had been tested and validated in previous research (Tschannen-Moran & Woolfolk Hoy, 2001). The fifth threat of statistical regression refers to participant selection based upon extremely high or low scores on a pre-test that on the post-test regress toward the mean. No participants in this study were selected based upon pre-test scores which controlled for regression.

The sixth threat of differential selection occurs when groups that are formed prior to the study are compared and found to have different characteristics which then influence the post-test. Selection threat is controlled by randomization, which was not possible in this study. If differential selection were to occur because the groups were already formed and differences between the two groups

were identified on any pre-test variable, statistical controls are normally instituted. The seventh threat, mortality, refers to any change in the experimental group when participants drop out of the study. Participants dropped out of both groups in this study; however, the control group retained 52 members and the experimental group retained 131 members. External threats to validity must also be considered.

Threats to External Validity

External validity indicates the extent to which the study results may be generalized to other populations (Gay & Airasian, 2000). There are seven threats to external validity: pretest-treatment interaction, selection-treatment interaction, multiple treatment interference, specificity of variables, treatment diffusion, experimenter effects, and reactive effects. Pretest-treatment interaction sensitizes participants to aspects of the treatment variable which influences their post-test scores. Self-report instruments are very susceptible to this threat (Gay & Airasian, 2000). Pretest-treatment interaction may not have been a severe threat to the experimental group because the pretest was administered 6 weeks or more prior to the post-test. The follow-up test was administered three to four months after the post-test. However, the

control group may have been affected by pretest-treatment

because all three test administrations occurred over only

three months time. The pretest-treatment interaction may

have influenced the post-test and follow-up results if the

educators remembered the questions and their earlier

answers, or if they researched the information prior to

taking the next test.

The second threat of selection-treatment interaction

is the non-random assignment of participants to either

group. None of the participants in this study were

randomly assigned. All participants volunteered, affecting

the generalizability of this study. The third threat of

multiple-treatment interference occurs when participants

receive more than one treatment which can affect later

treatments. For this study only one treatment, Schools

Attuned, was provided. This study results should not be

affected by multiple-treatment interference. Specificity

of variables, the fourth external threat, refers to the

specific conditions under which any study is conducted and

the difficulty in duplicating the exact study and

conditions for future studies. The only method of

controlling specificity threats is for the researcher to

clearly define the variables operationally, and to provide

carefully thought out conclusions and generalizations (Gay & Airasian, 2000).

The fifth external validity threat of treatment diffusion occurs when the groups involved communicate and adopt pieces of each other's treatment. Treatment diffusion did not affect this study because the groups did not know each other, and only one treatment was provided to one of the groups. Experimenter effects, the sixth threat, are the conscious or unconscious actions of the researcher which may affect participants' responses or performance. For this study, that the school district administration requested volunteers for the control group may have affected the study results. The control group volunteers may have assumed that the researcher was a district administrator whose underlying purpose was to examine through the Core Course Inventory how well the educators were performing as educators. This perception may have led to inflated efficacy scores on the three tests for the control group, who may have wanted to assure the administration of their competence.

The final threat of reactive effects occurs when people's attitudes about participating in a study affect their responses. If people feel they are receiving more attention during a study, their behavior may change.

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Reactive effects may have impacted this study. Educators

in both groups may have been affected by the attention

given them by their districts or because they were involved

in a professional development program provided by the

state. In more than one school district, participation in

Schools Attuned was arranged by the district superintendent

and stipends were paid for those who participated.

Methods of controlling threats include randomization,

matching, group comparisons, using the statistical method

of analysis of covariance, and using participants as their

own controls (Gay & Airasian, 2000). The first control of

randomization was not possible in this study as

participants in both groups volunteered to participate and

were intact groups. The differences in size (greater than

2/1) between the experimental group (n = 131) and the

control group (n = 52) did not permit matching or equating

groups, the second and third controls for threats to

validity. However, the groups compared in this study were

homogeneous with both groups consisting of elementary and

secondary educators, controlling for some threats to

validity. The statistical method of analysis of

covariance, the fourth control, equates randomly formed

groups on one or more variables; however, this method is

not recommended for use with intact groups (Huck, 2000) as

occurred in this study. The fifth control, using

participants as their own control, involves exposing

participants to different treatments, one treatment at a

time (Gay & Airasian, 2000). This study exposed

participants to only one treatment and both the control and

experimental group were assessed at three points in time

with a repeated measure. Consequently, the repeated

measures design was determined to be the method most likely

to control for the most threats to external validity.

This study was guided by four null hypotheses:

H1. There is no significant difference over
     time in the Student Engagement efficacy
     scores of educators who participated in
     the Schools Attuned program compared to
     those who did not.
H2. There is no significant difference over
     time in the Instructional Strategies
     efficacy scores of educators who
     participated in the Schools Attuned
     program compared to those who did not.
H3. There is no significant difference over
     time in the Classroom Management efficacy
     scores of educators who participated in
     the Schools Attuned program compared to
     those who did not.
H4. There is no significant difference over
     time in the Implementation of Schools
     Attuned efficacy scores of educators who
     participated in the Schools Attuned
     program compared to those who did not.

An analysis of test score patterns over time was conducted

to determine treatment effectiveness.

Sample

The population for this study is kindergarten to grade 12 teachers, counselors, and administrators who work in school districts in the Tulsa, Bartlesville, and Miami, Oklahoma, areas. A population is the group of interest to the researcher that has at least one characteristic that differentiates it from other groups (Gay, 1987, p. 102). The Northeast Region extends from Tulsa north to the Kansas border as districted by the Oklahoma Schools Attuned organization. The Region includes the counties of Washington, Nowata, Rogers, Craig, Ottawa, Delaware, Creek, Wagoner, Mayes, Osage, and Tulsa.

The sample for this study consisted of an experimental group (n=131) that received training in the Schools Attuned program and a control group (n=52) that did not receive the training. A sample is a representative subset of a larger population (Gay & Airasian, 2000). Prior to participation in this study, both experimental and control groups read and signed consent forms that explained IRB guidelines for Oklahoma State University. Appendix B contains the consent form given to the experimental group while Appendix C contains the consent form given to the control group. No participant was identified by name but was given a code

number, and data were analyzed as group data so confidentiality was maintained.

The experimental group of educators voluntarily initiated contact with Oklahoma Schools Attuned and voluntarily registered online to participate in the Schools Attuned Core Course in the region. No educator was denied participation. Initially, 184 educators registered online and participated in the Core course. However, through non-completion of the Course Inventory over time, the experimental group decreased to 131 educators, a decrease of 29%. Some participants attending the Core Course registered late and did not have the opportunity to pre-test. Those participants who did not pre-test were eliminated from the study results. In addition, follow-up tests were not returned by 22 participants. These participants were also eliminated from the study. This phenomenon was examined to be sure there was no pattern which revealed random causes such as illness, lack of child care, and other professional and personal issues.

The control group consisted of educators from two elementary schools, one middle school, and one high school in the Tulsa area. Permission from the school district administration was requested and received before proceeding. The school principals were contacted by the

district administration and volunteers were invited to participate in this study. Initially the control group consisted of 84 teachers, counselors, and administrators. Through a process of non-completion of the Course Inventory over time from pre-test to post-test to follow-up, the control group decreased to 52 educators, a decrease of 38%. This phenomenon was examined to be sure there was no pattern which revealed random causes such as illness, lack of child care, and other professional and personal issues. An opportunity to participate in the Schools Attuned program was offered to participants in the control group at the completion of this study. Thus, the actual sample numbers were 131 educators in the experimental group and 52 educators in the control group.

<div align="center">Instrument</div>

Data were collected with the Core Course Inventory (see Appendix A). Items from the Core Course Inventory were derived from two sources: (1) the 24 item form of the Teacher Sense of Efficacy Scale (TSES) (Tschannen-Moran & Woolfolk Hoy, 2001) and (2) 17 items specific to Schools Attuned developed by the researcher. In addition, six demographic items and one item addressing familiarity with Schools Attuned were included at the end of the Inventory. The format of the TSES items influenced the construction of

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the Schools Attuned items. Consequently, the TSES will be
discussed first.

The Teacher Sense of Efficacy Scale

Bandura (1997, 2001) developed a guide for self-
efficacy scale composition along with a 30-item unpublished
scale to more specifically measure teacher self-efficacy.

> Scales of perceived self-efficacy must be
> tailored to the particular domains of
> functioning that are the object of interest.
> The "one-measure-fits-all" approach usually
> has limited explanatory and predictive value
> because most of the items in an all-purpose
> measure may have little or no relevance to
> the selected domain of functioning. (Bandura,
> 2001, p. 1)

Tschannen-Moran and Woolfolk Hoy (2001) modified the
unpublished scale to include items that address specific
teaching tasks and personal teaching competence. This
modified instrument was revised and refined through three
studies conducted at Ohio State University. A long form
with 24 items and a short form with 12 items were developed
and introduced as the Teacher Sense of Efficacy Scale
(TSES) (Tschannen-Moran & Woolfolk Hoy, 2001).

The TSES has three efficacy subscales as determined by
factor analysis: (1) Student Engagement, (2) Instructional
Strategies, and (3) Classroom Management. While being more
specific than previous measures, the TSES is not so
specific as to "render it useless for comparisons of

teachers across contexts, levels, and subjects" (Tschannen-Moran & Woolfolk Hoy, 2001, p. 802). Teachers are able to measure their efficacy strength for influencing teaching activities within the classroom. Teachers are asked about their perceptions of their efficacy beliefs. For example, the Student Engagement subscale asks, "How much can you do to get through to the most difficult students?" The Instructional Strategies subscale asks the teacher to respond to, "How much can you gauge student comprehension of what you have taught?" Finally, the Classroom Management subscale asks, "How much can you do to control disruptive behavior in the classroom?"

The Ohio State University researchers used Cronbach's alpha to establish reliabilities for the TSES subscales and for the total instrument: Student Engagement = .87; Instructional Strategies = .91; and Classroom Management = .90. The Cronbach's alpha for the overall scale is .94 (Tschannen-Moran & Woolfolk Hoy, 2001). The TSES may be administered to both pre-service and experienced teachers; however, the two groups require different methods of data analysis (M. Tschannen-Moran, personal communication, February 9, 2005).

The three highly correlated subscales come together as one factor in second order factor analysis and can be

analyzed as a total score. A total score analysis is appropriate for pre-service teachers as they do not seem to discriminate efficacy strength sufficiently for the three subscales to have validity. Analysis of only the subscale scores is appropriate for experienced teachers. The total score is the average of the three subscales scores added together; therefore, analysis of the total score in combination with the three subscale scores would be inappropriate as the data would compete with itself to explain the variance. The total TSES score was not analyzed in this study as the participants were experienced educators.

The Schools Attuned Scale

Seventeen items were developed to specifically address the Schools Attuned program. Eleven of the seventeen items address the eight learning constructs or categories covered in the Schools Attuned Core Course. An additional 6 of the 17 items address concepts and skills learned at Schools Attuned, such as helping students understand and manage their own learning, linking student performance to the learning constructs, and assisting students in developing their own areas of expertise. Each of the 17 items was constructed to read in a similar manner to the items on the TSES (Tschannen-Moran, Woolfolk Hoy, 2001). For example,

the learning construct of Memory is addressed through the item that asks, "To what extent can you identify students' weaknesses in mental energy controls?" The construct of higher order cognition is addressed by the item that asks, "How well can you manage learning differences in concept formation?" Content validity of these items was established by an expert panel consisting of three Oklahoma Schools Attuned Regional Coordinators, one Learning Specialist affiliated with Schools Attuned, and one administrator from the All Kinds of Minds Institute. These individuals have experience as managers of the Schools Attuned program and have frequently facilitated the program in Oklahoma and North Carolina.

A factor analysis using SPSS 11.5 was used to determine underlying concepts and construct validity of the 17 Schools Attuned items. Factor analysis of the TSES items was previously reported (Tschannen-Moran & Woolfolk Hoy, 2001). Factor analysis is a statistical method of reducing a large amount of data to workable proportions by grouping variables into factors based on their attributes or characteristics and is associated with construct validity. Construct validity is the degree to which an instrument measures a hypothetical construct, a non-observable trait that explains behavioral differences (Gay

& Airasian, 2000). Factor analysis can be used "to confirm hypothesized relationships among the data" (Kim & Mueller, 1978, p. 9). Reducing the data by factor analysis also creates a chart or correlation matrix. This matrix shows variable correlations or the relatedness between each combination of variables. Based upon the correlation matrix, an unrotated factor matrix is then created. This factor matrix shows the degree to which each variable correlates and groups with or "loads" on each factor (Kachigan, 1982). The degree of variable correlation or factor loading can range from -1.00 to +1.00. The higher the factor loading toward +1.00 or -1.00, the stronger the relationship or correlation between the variables within the factor. The lower the factor loading, for example - 0.15, the less correlation of the variables to that factor. The highest loading factors are determined by accounting for at least 70% of the total variance (Gorsuch, 1983, p. 367).

From the factor matrix, the number of factors to retain based upon the strength of each factor's relationship with particular variables can be determined (Munro, Visintainer, & Page, 1986). One common method of factor retention determines factor eigenvalues which represent the total amount of variance explained by a

factor (p. 271) and correspond to an equal number of variables the factor represents. The eigenvalue of a factor is computed by adding the squared loadings in that factor's column. Next, the percent of variance is computed by dividing the eigenvalue by the number of items in the column. The preferred method is to "interpret factors that each account for at least 5% of the variance and have an eigenvalue equal to or greater than 1.00" (Munro, Visintainer, & Page, 1986, p. 272) with the first factor accounting for the largest part of the total variance. Less of the variance is consecutively accounted for by the remaining factors. However, the decision to retain factors is also supported by other techniques.

Two of those supportive techniques are to (1) explain as much of the variance as possible with the use of as few factors as possible and (2) to use a scree test which plots on a graph the total variance percentages for which all of the factors account. The scree test leaves the "rubble" at the bottom of the graph and validates the stronger factors plotted just before the curve levels. A comparison with the eigenvalues can then be made and a decision reached regarding which factors to retain. Once the factors to retain are decided upon, they are further simplified by "rotation of factors."

Factor rotation provides even more meaning and definition in identifying the variables correlated with each new factor. These factors can be "orthogonal" and uncorrelated with each other, or they can be "oblique" factors that are somewhat related to each other. Orthogonal rotation is most common when the researcher is determining possible unrelated subscales in instrument creation (Munro, Visintainer, & Page, 1986). Although "the most common rotations are varimax, quartimax, equimax, and oblimin rotations, the varimax rotation is most often used for orthogonal rotation" (p. 274). The best orthogonal analytic rotation method is Kaiser's Varimax. Kaiser created the varimax method in order to clean up the factors so that each factor loads high on a small number of variables and low on all the others (Stevens, 2002). These rotations redistribute the variance among the new factors and can assist the researcher in more exactly interpreting them.

The redistribution loadings tend to be very low or very high with few medium-sized loadings. The loadings on this matrix are then squared to determine the variance accounted for by each factor. Because there are no widely accepted statistical standards as to significant loading, the researcher must often decide the meaningfulness of a

high or low loading. "In actual practice, loadings of .3, .4, or .5 are most often used as lower bounds for meaningful loadings" (Munro, Visintainer, & Page, 1986, p. 252). The factors are then thoughtfully named so as not to mislead the conclusions of the study or jeopardize study replication. Factors are named based upon a general description of their variables or their essence instead of the specific name of one of the variables.

Underlying concepts of the 17 Schools Attuned items were examined to determine whether they formed multiple constructs or one major construct. A principal component analysis was conducted with varimax rotation with Kaiser Normalization on the 17 Schools Attuned items which yielded one factor which was named Efficacy for Implementation of Schools Attuned (see Table 1).

Table 1: Factor Analysis of Schools Attuned Items.

Item	Factor Loading	Schools Attuned Items
1	.585	To what extent can you identify students' weaknesses in mental energy controls?
2	.559	To what extent can you construct a student's neurodevelopmental profile?
3	.673	How well can you manage learning differences in concept formation?
4	.513	To what extent can you identify students' weaknesses in saliency determination?

Table 1: Factor Analysis of Schools Attuned Items,
continued.

_____

Item	Factor Loading	Schools Attuned Items
5	.617	How much can you do to strengthen students' development of their own areas of expertise?
6	.391	To what extent can you identify students' weaknesses in phonological processing?
7	.668	To what extent can you provide management strategies to strengthen student's weaknesses at the discourse level?
8	.633	To what extent can you provide management strategies to strengthen students' interpersonal skills?
9	.501	To what extent can you describe observable phenomena in the classroom?
10	.462	To what extent can you access the online Learning Base for Schools Attuned resources?
11	.565	How well can you accommodate learning differences in graphomotor functioning?
12	.665	To what extent can you provide management strategies to strengthen students' weaknesses in self-regulation?
13	.656	How much can you do to help students understand their learning?
14	.643	To what extent can you provide management strategies to strengthen students' weaknesses in time management?

Table 1: Factor Analysis of Schools Attuned Items,
continued.

Item	Factor Loading	Schools Attuned Items
15	.681	To what extent can you provide interventions for students' weaknesses in spatial ordering?
16	.676	How well can you link classroom performance to the neurodevelopmental constructs?
17	.692	To what extent can you identify students' weaknesses in organizational skills?

Factor Eigenvalue = 6.207

   Internal consistency was then assessed using
Cronbach's alpha, a measure of the inter-correlation
strength of all of the items or of how well a set of items
measures a single construct. Reliability is "consistency
across the parts of a measuring instrument, with the
'parts' being individual questions or subsets of questions.
To the extent that these parts 'hang together' and measure
the same thing, the full instrument is said to possess high
internal consistency reliability" (Huck, 2000, p. 89). The
more items in a scale, the more reliable is the measurement
with a higher number indicating they are measuring the same
construct. If every item measured the same concept and

were perfectly reliable, the coefficient would equal 1.0.

An average inter-item correlation above 0.30 is needed as a

"rule of thumb" to provide greater uniformity in scale

development and assessment (Gillis & Jackson, 2002, p.

438).

Initial reliability of the 17 Schools Attuned items

was computed which revealed a Cronbach's alpha of .881 with

the item reliability for the 17 items loading from .391 to

.692. Item 6 loaded at only .391 and was removed.

Reliability was again computed for 16 Schools Attuned items

which raised the Cronbach's alpha to only .882. Item 10,

loading at only .462, was next removed, and reliability was

computed a third time for 15 Schools Attuned items, raising

the Cronbach's alpha for the Schools Attuned factor to only

.883. Based upon the ".30 rule of thumb" and that the

removal of these two items effected such a small increase

it was decided to include them in the one factor, "Efficacy

for Implementation of Schools Attuned."

Demographic Items

In addition to the three TSES subscales and the

Schools Attuned Scale, six demographic questions address

educators' total years of educational experience, current

level (elementary or secondary), current position (teacher,

counselor, or administrator), nationality, gender, and age.

The demographic items were included with the TSES and the

Schools Attuned Scale to form the Core Course Inventory.

The Schools Attuned items were the even-numbered items

through item 34 of the Core Course Inventory. The odd-

numbered items and those numbered 35 through 41 were the

TSES items. The demographic items numbered from 41 through

46.

The Core Course Inventory

    The Core Course Inventory was then piloted on alumni

of Schools Attuned to determine readability. Based upon

participant responses, several changes in the format of the

Core Course Inventory were made: educational position was

clarified; the scale was altered from a 1 to 9 point scale

to its current form ranging from 0 to 8; and anchor phrases

were added for every response point for clarification. The

current form utilizes a 9 point Likert-type scale with

responses for each response point ranging from No Influence

(0) to A Great Deal of Influence (8). Efficacy strength is

fluid, varying across tasks (Bandura, 1997). According to

Bandura (2001), response scales should have sufficient

responses to allow for beliefs of incapability and to be

sensitive to intermediate positions of efficacy (p. 4).

The range of responses on the Core Course Inventory allows

for efficacy strength variations, for example from (0) for

no efficacy or cannot complete the task through (4) for

moderate efficacy or sometimes can complete the task to (8)

for a great deal of efficacy or certainly can complete the

task (see Appendix A).

Procedure

The Core Course Inventory was administered to the

experimental group as a pre-test at pre-Schools Attuned

Course meetings held at the end of the school year at

school sites throughout the region. Eight weeks later on

average upon completion of the fifth day of the 6-day Core

Course, the Inventory was administered as a post-test.

More time is available on the fifth day of the Course in

contrast to the sixth day when participants practice what

they have learned and participate in culminating

activities. Approximately half-way through the year-long

professional development program an average of 17 weeks

after the post-test, the experimental group completed the

Core Course Inventory for the third and final time at a

Practicum session or during site visits to their schools.

This final administration is called the Follow-up

Inventory.

The Core Course Inventory was administered to the

control group three times an average of 4 weeks apart

during the fall semester at their school sites. The

control group consisted of schools that were asked to participate in this study by the district office. There was no incentive to participate, other than one dollar in the envelope containing the Inventory for each participant who completed it. The pre-test was administered a month after the new school year began. The post-test was administered and then the follow-up test approximately two months after the post-test.

The dependent variables for this study are the respondents' ratings of self-efficacy on the Core Course Inventory. This inventory contains four dependent variables of self-efficacy for Student Engagement, Classroom Management, Instructional Strategies, and Implementation of Schools Attuned. The independent variable is whether or not the educators participated in the Schools Attuned program. The relationship between the dependent and independent variables is known as "the effect of the independent variable upon the dependent variable" (Weinfurt, 1995, p. 250).

Based upon the four dependent variables of self-efficacy, the repeated measurements of the independent variable over time, and the non-equivalency of the two groups of participants, a repeated measures multivariate analysis of variance (MANOVA) was determined to be the most

appropriate statistical analyses for this study. A MANOVA
is used when there are two or more correlated dependent
variables on which a single overall statistical test can be
performed to explore if the independent variable influences
responses on the dependent variables (Stephens, 2002). A
MANOVA examines the effect of the independent variable on
several dependent variables and helps to control for Type I
error by keeping the error rate at the minimum alpha level
(Weinfurt, 1995).

The assumptions of the repeated measures MANOVA were
analyzed first at an alpha level of .05. There are three
assumptions for MANOVA: (1) independence of observations,
(2) the multivariate distribution of observations in each
group is normal, and (3) the population covariance matrices
are equal. The use of repeated measures adds the fourth
assumption of sphericity (Stevens, 2002, p. 257).

<u>The Assumptions of MANOVA</u>

<u>Independence of Observations</u>

The first and most important assumption of a MANOVA is
that of independent observations (Stevens, 2002; Weinfurt,
1995). A violation of the assumption of independence of
observation is very serious. When observations are
dependent, the actual alpha or the percent of time one is
falsely rejecting if one or more of the assumptions is

violated is inflated to several times the level of significance, leading to Type I error (Scariano & Davenport, 1987). The participants in this study are independent because they are included in either the treatment group or the control group. There is no relationship between the participants in the two groups. Even though the Core Course Inventory was administered in group environments, it is reasonable to assume that the participants may respond independently for the following reasons: (1) participants are not required to generate correct answers but to choose what they feel is closest to their own capabilities; (2) participants have no reason to be affected by how other participants respond to the inventory; (3) participants' interactions are strictly limited during administration. For this study the independent assumption was not violated because there was no relationship between the groups which were independent and responded independently.

Multivariate Normality

The second assumption for MANOVA is that observations on each of the dependent variables follow a multivariate normal distribution in each group (Stevens, 2002). This assumption is difficult to satisfy for MANOVA (Weinfurt, 1995) because the independent variables (treatment vs

control; pre-test, post-test, follow-up test) must be normally distributed along with any linear combination of the dependent variables (4 dimensions of efficacy) (Stevens, 2002, p. 262). In addition all dependent variable subsets must have a multivariate distribution (Stevens, 2002, p. 262; Weinfurt, 1995, p. 254).

Although there is no multivariate normality test available on major computer software, determination of normality is possible by checking bivariate normality and by determining the normality of the marginal distributions (Stevens, 2002, pp. 262-263). The bivariate normality for correlated variables suggests the scatter plots for each pair of variables will be elliptical. The more highly correlated the variables, the thinner the scatter plot ellipse. For this study, an analysis of the scatter plot of each pair of dependent variables was tested by observations of the scatter plots of each pair of dependent variables at each time point, revealing an ellipse shape.

Nonetheless, the lack of multivariate normality has little effect on Type I errors (Everitt, 1979; Maradia, 1971; Olson, 1974). Research indicates that deviation of the actual alpha or probability of rejecting the null hypothesis when it is true is within .02 of the level of significance for the levels of .05 and .10 (Stevens, 2002,

p. 262). The Type I and Type II error rates for the *F* statistic or the transformed statistic used to reach a probability level are significantly altered only when the distribution deviates extremely from the normal. Because the least effect assumption in MANOVA is normality and MANOVA is considered a robust test, it is reasonable to assume the violation of this assumption does not affect the validity of the test (Stephens, 2002; Weinfurt, 1995).

Homogeneity of Variance

    The third assumption of MANOVA is that of homogeneity of covariance or that the different groups have similar variance-covariance matrices. It is very unlikely that the equal covariance matrices assumption can be satisfied in practice (Stevens, 2002). Questions of investigators are usually whether the violation of this assumption that occurred in practice will have much effect on power and whether it will affect the alpha level liberally or conservatively. Two major Monte Carlo studies have examined the effects of unequal covariance matrices on error rates in the two-group case (Hakstian, Roed, & Linn, 1977; Holloway & Dunn, 1967;). Their results show that equal group sizes keep the actual alpha very close to the level of significance. Unequal group sizes with the larger variability in the small group produces a liberal test, and

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unequal group sizes with the larger variability in the large group produce a conservative test (Stevens, 2002, p. 262). With liberal results, the actual alpha is greater than the level of significance and the null hypothesis is too often rejected falsely. With conservative results, the actual alpha is smaller than the level of significance, causing a decrease in power. However, even in the event of unequal covariance matrices, MANOVA is considered robust (Stevens, 2002). This assumption is usually tested with Box's Test of Equality of Covariance Matrices, also conducted for this study. This test was statistically significant for the repeated measures MANOVA M = 307.3, F (78, 32358.66) = 3.575, p < .01. This indicated that the covariance matrices of the experimental and control groups were different from each other.

Upon examination of the variances and covariances for the dependent variables of the two groups, the variances and covariances of the experimental (n = 131) group were smaller than the covariances of the control group (n = 52) for time two and time three. The experimental group had smaller standard deviations than the control group, perhaps because they received Schools Attuned training so they are more similar to each other, reducing the variance.

However, MANOVA is considered robust to unequal covariance matrices (Stevens, 2002).

Sphericity

The fourth assumption of repeated measures analyses is sphericity. Sphericity requires that when there are three or more trials or time points, the errors be normally and independently distributed and the variances of the differences for all pairs of repeated measures be equal (Stevens, 2002). If the sphericity assumption is violated, the F statistic is positively biased increasing the risk for committing Type I errors. The statistical procedure to evaluate sphericity is Mauchly's Test of Sphericity. The computer software SPSS computes Mauchly's Test producing a Mauchly's W, a chi-square statistic, and values for the Huynh-Feldt epsilon and the Greenhouse-Geisser epsilon. A significant chi-square statistic indicates sphericity is not tenable and either the degrees of freedom for the univariate F must be adjusted or the multivariate results must be used.

If Mauchly's Test yields a significant result, a smaller pair of degrees of freedom values may be applied in determining the critical F-value used to evaluate the calculated F-value. Mauchly's Test yields the Greenhouse-Geisser epsilon, a measure of how well sphericity has been

met, which is used to calculate the smaller degrees of freedom values. The Greenhouse-Geisser correction assumes sphericity is violated to the maximum extent, results in a conservative *F*-test rather than a liberal *F*-test, and reduces the degrees of freedom and the risk of Type I error. Sphericity can range from 1 (perfect sphericity) to $1/k - 1$ (worst violation), where *k* is the number of levels or trials for the within-subjects variable.

Greenhouse and Geisser suggest basing the degree of freedom values on what would be the appropriate value if there were only two levels of the repeated measures factor (Huck, 2000, p. 478) by adjusting the degrees of freedom from (k-1) and (k-1)(n-1) to 1 and (n-1) (Stevens, 2002, p. 501). For maximum violations of sphericity (epsilon < .75) the "regular" degrees of freedom associated with the *F*-test are multiplied by the value of the Greenhouse-Geisser epsilon (Huck, 2000, p. 478). This creates a dramatic reduction in the critical value's degrees of freedom. The Greenhouse-Giesser correction was utilized for this study because the tests were found to be significant. The Mauchly's Test significance levels are provided with the hypotheses results.

The Repeated Measures Analyses

One purpose for a repeated measures analysis is to describe conditions for within-subjects and between-subjects on the dependent variables (Weinfurt, 2000). The use of repeated measures explores whether the means of the within-subjects or participants' responses at each time point of the independent variable are significantly different from each other, providing the main effect for time and the interaction between the group and time (Weinfurt, 1995). The between-subjects analysis compares each group's average performance across the three time points. For this study, the within-subjects variables are the pre-test, post-test, and follow-up test data for each participant. The between-subjects variables are the experimental group and the control group.

Linear and quadratic contrasts planned for the within-subjects effect can determine any change and the pattern of change over the three time points. Linear contrasts compare the means of the pre-test (T1) and the follow-up (T3) test to see if they are significantly different from each other. A significant linear contrast or difference between time 1 and time 3 indicates that the scores either significantly increase or decrease over time. Quadratic contrasts average the pre-test (T1) and follow-up test (T3)

and compare the average to the post-test (T2) to see if there is a difference. A significant quadratic contrast indicates the pattern of change from T1 to T2 is different from the pattern of change from T2 to T3.

In examining the analysis of the three subscales of the TSES and the Schools Attuned scale in the Core Course Inventory, the Wilk's Lambda multivariate statistic was also examined. Wilk's Lambda, the most popular multivariate test statistic used in MANOVA (Weinfurt, 2000), is examined to determine the significance of differences in the between-subjects tests. Wilk's Lambda, which can range from 0 to 1, compares the variance matrices of within-groups to the total matrix. Lambda is the proportion of variance not explained by the independent variable, and if the lambda statistic is small, the variance not explained is also small. The higher the statistic, the closer the association of the variables (Gillis & Jackson, 2002). The proportion of variance that is explained by the effect of the independent variable is expressed as partial *Eta squared* or *partial η^2* on the SPSS printout. Partial η^2 is the proportion of the effect plus the error variance and is expressed as *partial* $\eta^2 =$ $SS_{effect}/(SS_{effect} + SS_{error})$. For example, *partial $\eta^2 =$* .416 means that 41.6% of the variability in the dependent

variable can be explained by the independent variable.
Data collection for both the treatment group and the
control group was completed and then transferred to a data
management file.

CHAPTER IV

FINDINGS

Data were gathered to determine the effect of a professional development program, Schools Attuned, on educators' self-efficacy. The data for this two-group quasi-experimental longitudinal repeated measures study were gathered from Oklahoma educators. The experimental group consisted of 131 full-time public school administrators, counselors, and teachers who voluntarily enrolled and participated in the year-long Oklahoma Schools Attuned professional development program. The control group consisted of 52 full-time public school teachers, administrators, and counselors who volunteered to participate in the control group. The control group did not participate in the Schools Attuned training nor had they registered to participate at any previous time. The Core Course Inventory was used to obtain the data.

Demographic data collected were related to years of educational experience, gender, nationality, age, occupational position, and position level. The data were

collected from the experimental group with the Core Course Inventory on three different occasions: prior to the Schools Attuned Core Course, on the fifth day of the 6-day Schools Attuned Core Course, and at the second follow-up session or Practicum held during the year-long Schools Attuned program. Data were collected from the control group with the Core Course Inventory on three different occasions: at the end of the first month of a new school year, and twice within the following three months. Demographic data were organized to facilitate descriptive analysis and included measures of central tendency, frequency, and percentages.

A review of the responses revealed that 12 participants in the experimental group did not answer Item 8 on the Pre-Core Course Inventory. Item 8 targets "saliency determination". This terminology is vocabulary that the participants learn at the Course to define students' "knowing what is important." Participants' non-response to Item 8 could indicate their unfamiliarity with the vocabulary. It was decided by the researcher that indicating no response to an item would result in a score of 0 on that item. A score of 0 is anchored with "No Influence" on the Core Course Inventory.

Profile of Variables

Responses were derived from a total of 183 public
school educators in Oklahoma. Public schools are
institutions that provide educational instruction for a
minimum of one grade of grades 1 to 12, have a minimum of
one teacher to provide instruction located in at least one
building, receive support from public funds, and are
operated by an education agency (National Center for
Education Statistics [NCES], 2002b, p. 1). Elementary
schools include grades kindergarten through 6 while
secondary schools generally include grades 7 through 12
(NCES, 2003, pp. 543, 552).

U.S. and State of Oklahoma data used in this study for
comparison purposes were based on only full-time
employment. Part-time employment was not reported. The
numbers of educators cited did not always sum to the totals
provided due to rounding. U.S. nationality data was
available for teachers only. No data on educators' ages
was available in the State of Oklahoma data. Secondary or
elementary teaching level was also unavailable for special
education teachers and counselors in the State of Oklahoma
data.

Of the 183 participants in this study, the majority
were female (89.01%) with the remaining participants

(10.99%) male. In comparison with all 2002-2003 full-time

Oklahoma educators and 1999-2000 national data, the study

had a higher percentage of females. Females accounted for

76.55% of all 2002-2003 full-time Oklahoma public school

teachers, principals, and counselors while males accounted

for approximately 23.45% (Oklahoma State Department of

Education, 2003b, p. 638). Nationally, almost three-

fourths (74.49%) of U.S. public school full-time staff are

female and one-fourth (25.11%) are male (NCES, 2003, p. 91)

(see Table 2).

Table 2: Frequency Distribution of Demographic Variables.

| | Study | | State | U.S. |
Variable	Number	Percent	Percent	Percent
Gender				
Male	20	10.99	23.45	25.11
Female	162	89.01	76.55	74.49
Age				
under 30	21	11.86	--	16.98
30-39	43	24.30	--	22.10
40-49	54	30.51	--	31.75
50-59	52	29.38	--	26.17
60 and over	7	3.95	-	3.00
Nationality				
African American	4	2.21	3.90	7.58
Hispanic	8	4.42	0.85	2.30
Native American	14	7.73	3.87	0.86
Asian	0	0.00	0.31	1.61
White	155	84.70	91.06	84.32

Over half (59.89%) of the participants in this study
were between the ages of 40 to 59 years (see Table 2).
Those between the ages of 40 and 49 years were the largest
group composing almost one-third (30.51%) of the
participants. The second largest group of educators ranged
in age from 50 to 59 and comprised 29.38% of the
respondents. Slightly over one-tenth (11.86%) of the
participants were less than 30 years old. Those between
the ages of 30 and 39 years represented approximately one-
fourth (24.30%) of the participants. Those participants
ages 60 and up represented 3.95% of all respondents.
Although data on the ages of Oklahoma teachers for all
years was unavailable, comparison with national statistics
for 1999-2000 U.S. public school teachers reveals the study
participants were very similar in age to the general
population of teachers. Statistics indicate that 16.98% of
U.S. teachers are less than 30 years old, almost one-fourth
(22.10%) range in age from 30 to 39, almost one-third
(31.75%) range in age from 40 to 49, slightly over one-
fourth (26.17%) range in age from 50 to 59, and 3% are ages
60 and above (NCES, 2003, p. 80)(see Table 2).

The majority of participants in this study were
Caucasian (84.70%) but at a lower percentage than Oklahoma
public school educators (91.06%) (0SDE, 2003b, p. 1). The

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study participants were similar to the U.S. 1999-2000 national data, which was available for only teachers (84.32%) and did not include counselors or principals (NCES, 2003, p. 80) (see Table 2). The study also had a higher percentage of Native Americans (7.73%) than in the general population of Oklahoma public school educators (3.87%) and had almost 9 times more than in the U.S. population of Native American (0.96%) educators. Hispanic educators represented 4.42% of the study participants, almost double the national percentage (2.30%), and almost 5 times the number of Hispanic educators (0.85%) in Oklahoma (OSDE, 2003b, p. 638). There were fewer African-American (2.21%) participants in the study than in the general Oklahoma population of African Americans (3.90%) and less than half of national public school teachers (7.58%). There are more Asian (1.61%) teachers nationally than are represented in Oklahoma (0.31%) or in this study (0.00%) (NCES, 2003, p. 80). These differences could be related to the number of study participants working in urban rather than rural areas of Oklahoma.

Educators typically work at the specified levels of elementary or secondary education determined by their certification which is based upon university coursework undertaken prior to teaching or as part of their continuing

professional education. Level of instruction was not

published for the Oklahoma population (14.01%) of special

education teachers and counselors (OSDE, 2003b, p. 638).

In actual practice, counselors and special education

teachers work equally between elementary and secondary

levels (Certified Personnel Department, Tulsa Public

Schools, personal communication, March 16, 2003).

Therefore, the numbers of those educators were equally

divided between the elementary and secondary levels for

comparison purposes (see Table 3).

Table 3: Frequency Distribution of Total Group for
Professional Characteristics.

Variable	Study Number	Percent	Ok State Percent	U.S. Percent
Level				
Elementary	125	68.31	52.54	53.35
Secondary	58	31.69	47.46	46.65
Position				
Teacher	155	84.70	92.49	51.56
Counselor	14	7.65	3.77	1.70[1]
Administrator	14	7.65	3.73	2.47[1]
Experience				
Less than 3 years	25	13.73	11.82	12.90
3-9 years	44	24.17	29.67	28.80
10-20 years	72	39.56	31.16	28.50
21 and over	41	22.53	27.35	29.80

[1] An additional 44.27% of employees are counted as
   instructional and support staffs.

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Slightly more than one-half (52.54%) of all 2002-2003

Oklahoma public school educators were employed at the

elementary level and slightly less than half (47.46%)

worked at the secondary level (OSDE, 2003b, p. 638).

This is very similar to national statistics for elementary

educators (53.35%) and secondary educators (46.65%) (NCES,

2003, p. 90). However, over two-thirds (68.31%) of the

Schools Attuned participants were elementary educators

while about one-third (31.69%) were secondary educators

(see Table 3). Schools Attuned could have attracted a

higher number of females and elementary educators due to

the No Child Left Behind Act and the increasing emphasis on

individualized instruction in elementary schools,

especially in kindergarten through third grades.

Educators hold various positions within education.

Respondents in this study were teachers, counselors, and

administrators (see Table 3). Of the 183 respondents, over

three-fourths (84.70%) were teachers, with counselors

(7.65%) and principals (7.65%) equally represented. In

comparison, teachers comprised 92.50% of all 2002-2003

Oklahoma educators, principals comprised 3.73%, and

counselors comprised 3.77% of educators (OKSDE, 2003b, p.

638). The larger number of principals and counselors in

the study could be related to the request by the Schools

Attuned program that an administrator or counselor be a part of the participating team from each school.

Although many teachers enter the field immediately upon college graduation, others do not become educators until later in life. In addition, some educators become counselors and principals after teaching for several years. Frequently the age and experience data collected on educators is grouped according to common events in teachers' professional lives, such as that of being granted "tenure" and of becoming "vested." U.S. teachers are granted "tenure" after three to five years of probationary teaching as determined by their principals (Education Reporter, 1998, p. 1). After 10 years of successful employment, teachers are "vested" with their state teachers' retirement systems (Oklahoma State Teachers' Retirement System, in a personal communication March 12, 2004). They then possess a retirement account and are eligible for retirement benefits upon reaching retirement age. Consequently, common data groupings for years of educational experience are: less than three years, three to nine years, 10 to 20 years, and 21 years and over. However, national data for years of experience was available only for teachers (NCES, 2003, p. 81).

The participants in this study varied as to years of experience (see Table 3). Over one-tenth (13.73%) had less than 3 years of teaching experience which is similar to both the state (11.82%) (OKSDE, 2003a, p. 1) and national (12.90%) statistics (NCES, 2003, p. 80) (see Table 3). One-fourth of the participants (24.17%) had 3 to 9 years of teaching experience while considerably more of the populations of Oklahoma teachers (29.67%) and U.S. teachers (28.80%) had 3 to 9 years of experience. Considerably more than one-third of the participant group (39.56%) had between 10 and 20 years of experience in education. This group was slightly larger than the population with similar years of experience of Oklahoma educators (31.16%) (OSDE, 2003a, p. 1) and nationally for only teachers (28.5%) (NCES, 2003, pp. 80-81). Finally, less than one-fourth (22.53) of the study participants had more than 21 years of experience compared to slightly more in the population of Oklahoma teachers (27.35%) and that of U.S. teachers (29.80%). Although the majority of the participants had 10 to 20 years of experience and were elementary teachers, Schools Attuned requests that principals attend the Core Course with their teachers. The fact that nationally the average principal has only 8 years of teaching experience prior to becoming an administrator (NECS, 1993) may have

influenced the study data as the Inventory items targeted teaching tasks rather than administrative tasks.

Results

The four dependent variables, Student Engagement, Instructional Strategies, Classroom Management, and Implementation of Schools Attuned efficacy were found to be strongly correlated; therefore, it was appropriate to analyze them in a repeated measures MANOVA (see Table 4). The MANOVA assumptions and the assumption of repeated measures were also tested.

Table 4: Means, Standard Deviations, and Correlation Matrix of Efficacy Variables by Time Periods.

Pre-Test	M (SD)	1	2	3	4
Student Engagement (1)	5.18(1.02)	1			
Instructional Strategies (2)	5.47(1.25)	.765**	1		
Classroom Management (3)	5.00(1.19)	.760**	.806**	1	
Schools Attuned (4)	3.92(1.29)	.623**	.715**	.625**	1

*p < .05; **p < .01; ***p < .001

Table 4, continued: Means, Standard Deviations, and

Correlation Matrix of Efficacy Variables by Time Periods.

Post-Test	M (SD)	1	2	3	4
Student Engagement (1)	6.11(0.98)	1			
Instructional Strategies (2)	6.40(0.90)	.749**	1		
Classroom Management (3)	6.45(0.92)	.752**	.763**	1	
Schools Attuned (4)	5.79(1.31)	.684**	.648**	.594**	1

*p < .05; **p < .01; ***p < .001

Follow-Up Test	M (SD)	1	2	3	4
Student Engagement (1)	5.82(1.00)	1			
Instructional Strategies (2)	6.25(0.97)	.781**	1		
Classroom Management (3)	6.34(0.98)	.710**	.788**	1	
Schools Attuned (4)	5.44(1.23)	.706**	.664**	.550**	1

*p < .05; **p < .01; ***p < .001

<u>Hypotheses One Through Four</u>

A repeated measures multivariate analysis of variance (MANOVA) was confirmed as the most appropriate statistical analyses for this study based upon the strongly correlated four dependent variables (see Table 4). A two (treatment vs. control) by three (pre-test, post-test, follow-up test) repeated measures MANOVA at an alpha level of .05 examined whether the experimental group and the control group changed in efficacy over time and whether the two groups changed differently over time. In order to examine Hypotheses 1 through 4, the multivariate statistic Wilk's Lambda was examined for the time by group interaction, Λ = .677, F (8, 718) = 19.30, p < .001, $partial\ \eta^2$ = 18. There were significant differences between the experimental group and the control group.

Given the significant multivariate time by group interaction, the univariate between-subjects effects were analyzed to determine which dimensions of efficacy were significantly different. First, Mauchly's Test of Sphericity was examined and found to be significant for three of the four dependent variables: Instructional Strategies: W = .93, χ^2 (2) = 13.02, p = .001; Classroom Management: W = .94, χ^2 (2) = 11.78, p = .003; and Schools Attuned: W = .87, χ^2 (2) = 26.00, p < .001; however,

Mauchly's Test of Sphericity was not significant for
Student Engagement: W = .99, χ^2 (2) = 1.45, p = .485. For
the sake of consistency and conservatism, the Greenhouse-
Geisser correction was used for the degrees of freedom for
all four dependent variables.

The multivariate time by group effect was accounted
for by all four dependent variables, Student Engagement: F
(1.98, 359.13) = 33.83, p < .001, *partial η^2* = .16;
Instructional Strategies: F (1.87, 338.38) = 29.17, p <
.001, *partial η^2* = .14; Classroom Management: F (1.88,
340.44) = 26.02, p < .001, *partial η^2* = .13; and Schools
Attuned: F (1.76, 319.09) = 81.53, p < .001, *partial η^2* =
.31. The *partial η^2* indicates that participation in
Schools Attuned accounts for 16% of the variance in Student
Engagement efficacy, 14% of the variance in Instructional
Strategies efficacy, 13% of the variance in Classroom
Management efficacy, and 31% of the variance in
Implementation of Schools Attuned efficacy (see Table 5).

Table 5: Univariate Time-by-Group Effects.

Source	Sum of Squares	df	MS	F	η^2
Student Engagement	32.41	1.98, 359.13	16.33	33.83***	0.16
Instructional Strategies	31.43	1.87, 338.38	16.81	29.17***	0.14
Classroom Management	26.09	1.88, 340.44	13.87	26.02***	0.13
Schools Attuned	111.43	1.76, 319.09	63.21	81.53***	0.31

*p < .05; **p < .01; ***p < .001

The two planned polynomial contrasts were examined for each dimension of efficacy to determine how the groups differed over time. The first contrast examined the linear trajectory by comparing the pre-test data point with the follow-up test data point (T1 versus. T3). The second contrast examined whether there was a quadratic trend in the data by comparing the average of the pre-test and follow-up test data with the post-test data (T1 + T3/2 versus Test 2).

Hypothesis 1

Based on the univariate results of the MANOVA (see Table 5), the first hypothesis that there is no difference over time in efficacy for Student Engagement by group can be rejected. The planned contrast to determine how the two

groups differed found the linear contrast to be

significant, F (1, 181) = 31.08, p < .001, *partial η^2* =

.15. The quadratic contrast was also significant, F (1,

181) = 36.54, p < .001, *partial η^2* = .17.

While the control group evidenced no change over time

from pre-test to follow up, the Schools Attuned group

evidenced a clear quadratic pattern, starting lower in

student engagement efficacy than the control group

(M_E = 5.00, *SD* = .99; M_C = 5.63., *SD* = .99) but increasing

from pre-test to post-test (M_E = 6.30, *SD* = .75; M_C = 5.63,

SD = 1.28). The experimental group slightly decreased from

post-test to follow-up test (M_E = 5.90, *SD* = .83; M_C = 5.63,

SD = 1.33), ending with a mean student engagement efficacy

that is higher than the control group (see Figure 2).

There was a difference over time in efficacy for Student

Engagement between the two groups; thus, Hypothesis 1 is

rejected.

Figure 2: Means for Student Engagement Efficacy.

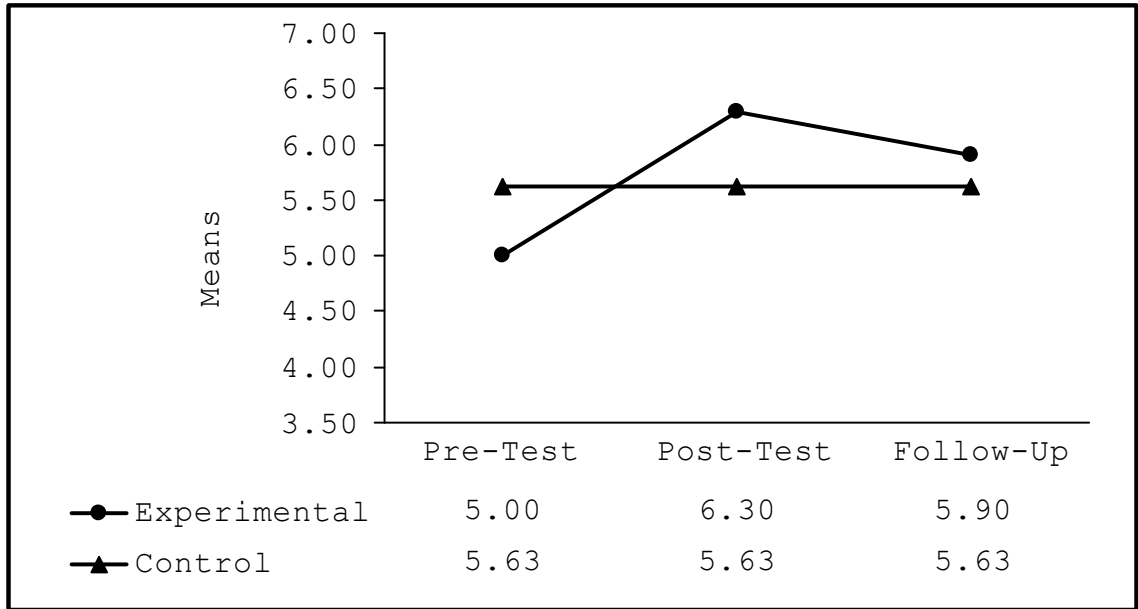|	Pre-Test	Post-Test	Follow-Up
Experimental	5.00	6.30	5.90
Control	5.63	5.63	5.63

Hypothesis 2

Based upon the univariate results of the MANOVA (see Table 2), the second hypothesis that there is no difference over time in efficacy for Instructional Strategies by group can be rejected. The planned contrast to determine how the two groups differed found the linear contrast to be significant, F (1, 181) = 20.77, p < .001, *partial η^2* = .10. The quadratic contrast was also significant, F (1, 181) = 40.72, p < .001, *partial η^2* = .18.

Although the control group evidenced no change over time from pre-test to follow-up test, the Schools Attuned group evidenced a clear quadratic pattern, starting with a lower mean than the control group at the pre-test

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(M_E = 5.21, SD = 1.20; M_C = 6.14, SD = 1.11), but increasing

from pre-test to post-test (M_E = 6.50, SD = .73; M_C = 6.15,

SD = 1.21). The experimental group slightly decreased from

post-test to follow-up test (M_E = 6.22, SD = .88; M_C = 6.32,

SD = 1.16) ending with a mean that is similar to the

control group (see Figure 3). There was a difference over

time in efficacy for Instructional Strategies between the

two groups; thus, Hypothesis 2 is rejected.

Figure 3: Means for Instructional Strategies Efficacy.

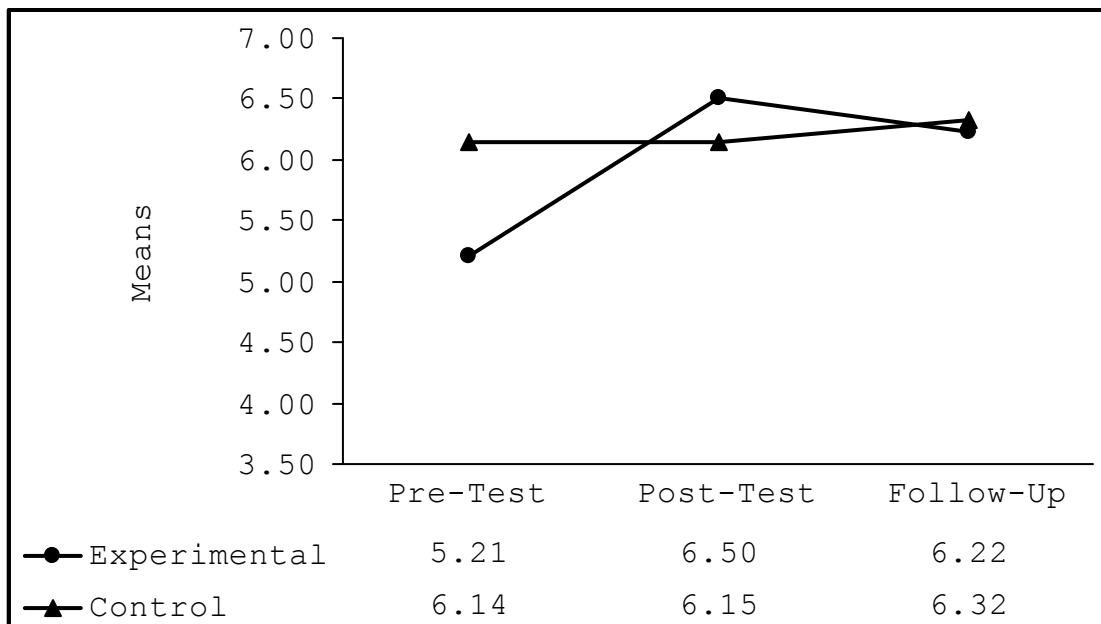|	Pre-Test	Post-Test	Follow-Up
Experimental	5.21	6.50	6.22
Control	6.14	6.15	6.32

Hypothesis 3

Based on the univariate results of the MANOVA (see

Table 5), the third hypothesis that there is no difference

over time in Classroom Management efficacy by group can be

rejected. The planned contrast to determine how the two

groups differed found the linear contrast to be
significant, F (1, 181) = 16.07, p < .001, *partial*
η^2 = .08. The quadratic contrast was also significant,
F (1, 181) = 40.33, p < .001, *partial* η^2 = .18.

The control group slightly decreased from pre-test to
post-test, then rose again for the follow-up test. The
Schools Attuned group evidenced a clear quadratic pattern,
starting with a lower mean than the control group at the
pre-test (M_E = 5.62, SD = 1.19; M_C = 6.32, SD = 1.04), but
increasing from pre-test to post-test (M_E = 6.59, SD = .73;
M_C = 6.12, SD = 1.23). The experimental group slightly
decreased from post-test to follow-up test (M_E = 6.34, SD =
.90; M_C = 6.33, SD = 1.17), ending with a mean similar to
the control group (see Figure 4). There was a difference
over time in efficacy for Classroom Management between the
two groups; thus, Hypothesis 3 is rejected.

Figure 4: Means for Classroom Management Efficacy.

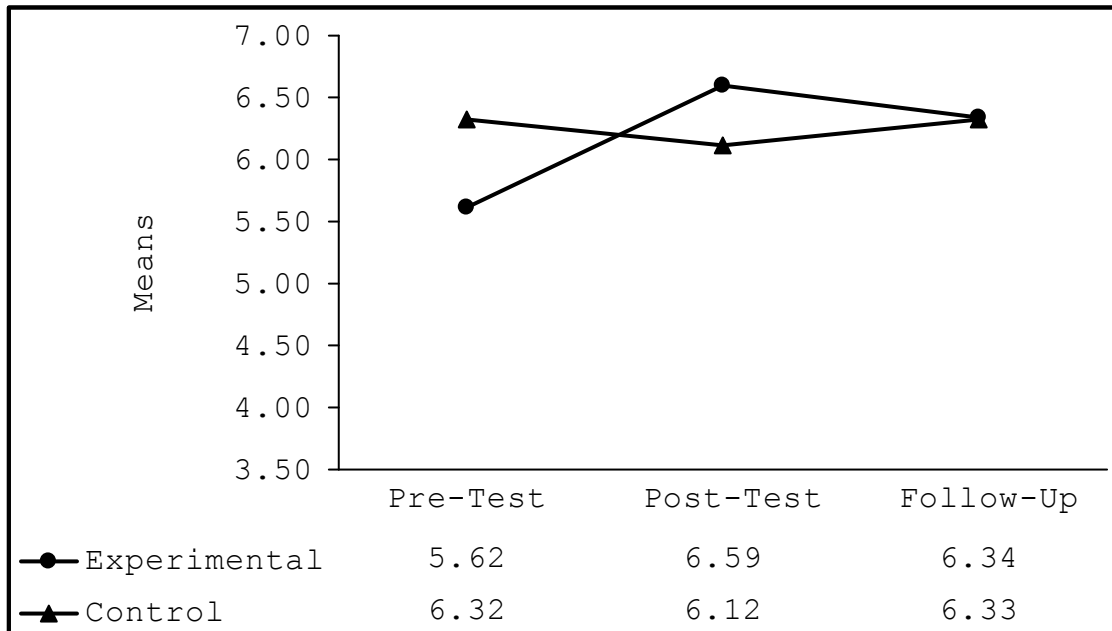|	Pre-Test	Post-Test	Follow-Up
●—Experimental	5.62	6.59	6.34
▲—Control	6.32	6.12	6.33

Hypothesis 4

Based on the univariate results of the MANOVA (see

Table 5), the fourth hypothesis that there is no difference

over time in efficacy for Implementation of Schools Attuned

by group can be rejected. The planned contrast to

determine how the two groups differed found the linear

contrast to be significant, F (1, 181) = 61.584, p < .001,

$partial \ \eta^2$ = .25, as was the quadratic contrast, F (1, 181)

= 110.64, p < .001, $partial \ \eta^2$ = .38.

The control group evidenced a linear pattern slightly

increasing from pre-test (M = 4.25, SD = 1.26) to post-test

(M = 4.40, SD = 1.40) to follow-up (M = 4.60, SD = 1.49).

However, the Schools Attuned group evidenced a clear

quadratic pattern, increasing from pre-test (*M* = 3.80,

SD = 1.28) to post-test (*M* = 6.34, *SD* = .75), and slightly

decreasing from post-test to follow-up test (*M* = 5.78,

SD = .91), but still ending with a follow-up score higher

than that of the control group (see Figure 5). There was a

difference over time in efficacy for Implementation for

Schools Attuned between the two groups; thus, Hypothesis

Four is rejected.

Figure 5: Means for Implementation for Schools Attuned

Efficacy.

	Pre-Test	Post-Test	Follow-Up
●—Experimental	3.80	6.34	5.78
▲—Control	4.25	4.40	4.60
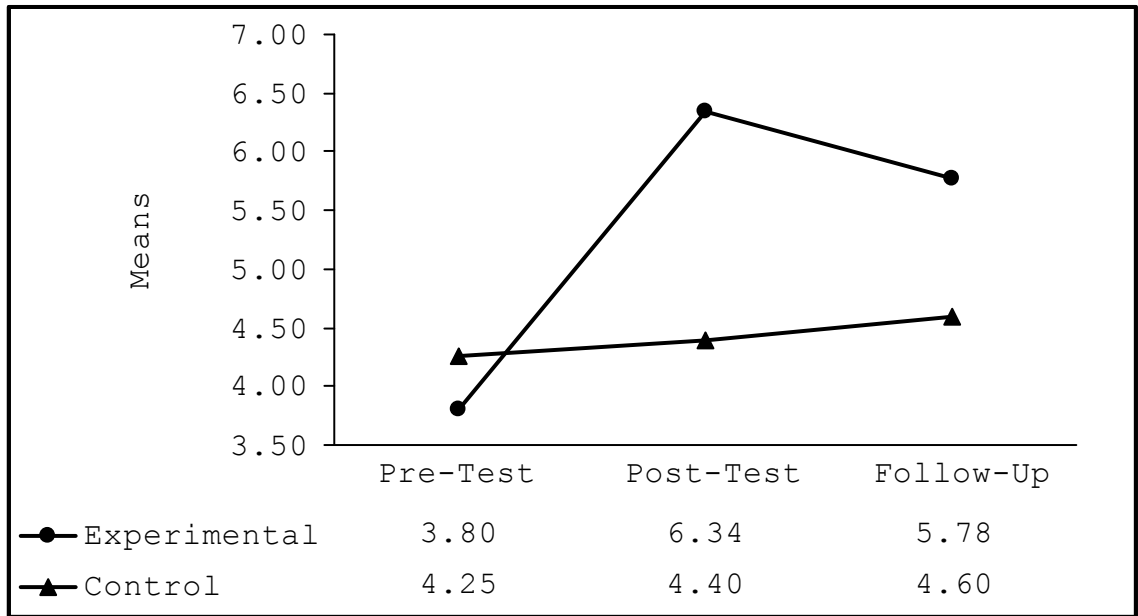
To better understand these analyses, the findings and

implications will be summarized.

Summary

While the *partial η²* effect sizes of participation in Schools Attuned ranged from 13% to 31%, the calculation of the percent improvement of a treatment such as Schools Attuned will be examined next. The examination of percent improvement is common in the field of education and may be more familiar to educators than effect size. Consequently, the researcher felt a post-hoc analysis to view the findings utilizing the percent improvement method was useful for practitioners.

Percent Improvement From Pre-Test to Post-Test

The percent improvement gained after a treatment can be calculated by using the formula*: [(posttest group mean minus pretest group mean) divided by (pretest group mean)] multiplied by 100*. A 25% or greater improvement is considered to be a significant difference (Long, 1995). Using the percent improvement formula to compute the percent improvement from the pre-test to the post-test, the experimental group reported their efficacy for Student Engagement improved 26%, Instructional Strategies improved 24.76%, Classroom Management improved 17.26%, and Implementation of Schools Attuned improved 66.84% at the time of the post-test (see Table 6).

Table 6: Percent Improvement for the Experimental Group.

Source	Pre-Test to Post-Test	Post-Test to Follow-Up Test	Pre-Test To Follow-Up Test
Student Engagement	26%	-6.35%	18%
Instructional Strategies	24.76%	-4.31%	19.39%
Classroom Management	17.26%	-3.79%	12.81%
Schools Attuned	66.84%	-8.83%	52.11%

Significance = 25% and higher

Table 7: Percent Improvement for the Control Group.

Source	Pre-Test to Post-Test	Post-Test to Follow-Up Test	Pre-Test To Follow-Up Test
Student Engagement	0%	0%	0%
Instructional Strategies	.16%	2.76%	2.93%
Classroom Management	3.16%	3.43%	.16%
Schools Attuned	3.53%	4.55%	8.24%

Significance = 25% and higher

Using the percent improvement formula to compute the percent improvement from the pre-test to the post-test, the control group reported their efficacy for Student Engagement improved 0%, Instructional Strategies improved .16%, Classroom Management improved 3.16%, and Implementation of Schools Attuned improved 3.53% although the control group received no Schools Attuned treatment (see Table 7). The percent improvement in efficacy between the post-test and the follow-up test were analyzed next.

Percent Improvement From Post-Test to Follow-Up Test

To calculate the percent improvement between the post-test and follow-up test, the test names used in the percent improvement formula were changed from pre-test and post-test to post-test and follow-up test. For example, only the names were changed from: *[(posttest group mean minus pretest group mean) divided by (pretest group mean)] multiplied by 100* to: *[(follow-up test group mean minus posttest group mean) divided by (posttest group mean)] multiplied by 100*. The level of significant difference remained at 25% or greater improvement.

Using the percent improvement formula to compute the percent improvement from the post-test to the follow-up test, the experimental group reported their follow-up test efficacy for Student Engagement decreased 6.35%,

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Instructional Strategies decreased 4.31%, Classroom

Management decreased 3.79%, and Implementation of Schools

Attuned decreased 8.83% (see Table 6).

Using the percent improvement formula to compute the

percent improvement from the post-test to the follow-up

test, the control group reported their efficacy for Student

Engagement improved 0%, Instructional Strategies improved

2.76%, Classroom Management improved 3.43%, and

Implementation of Schools Attuned improved 4.55% although

the control group received no Schools Attuned treatment

(see Table 7). The percent improvement in efficacy between

the pre-test and the follow-up test were analyzed next to

examine the total percent improvement gained.

Percent Improvement From Pre-Test to Follow-Up Test

To calculate the percent improvement between the pre-

test and the follow-up test, the test names used in the

percent improvement formula were changed from pre-test and

post-test to pre-test and follow-up test. For example, only

the names were changed from: *[(posttest group mean minus*

pretest group mean) divided by (pretest group mean)]

multiplied by 100 to: *[(follow-up test group mean minus*

pretest group mean) divided by (pretest group mean)]

multiplied by 100. The level of significant difference

remained at 25% or greater improvement.

Using the percent improvement formula to compute the percent improvement over time, the experimental group reported their efficacy for Student Engagement improved 18%, Instructional Strategies improved 19.39%, Classroom Management improved 12.81%, and Implementation of Schools Attuned improved 52.11% from the pre-test to the follow-up test (see Table 6).

Using the percent improvement formula to compute the percent improvement over time, the control group reported their efficacy for Student Engagement improved 0%, Instructional Strategies improved 2.93%, Classroom Management improved .16%, and Implementation of Schools Attuned improved 8.24% from the pre-test to the follow-up test, although the control group received no Schools Attuned treatment (see Table 7). The use of the percent improvement formula illustrates that over time Schools Attuned significantly strengthened teacher efficacy for the experimental group.

Although the experimental group and the control group were not tested simultaneously, this study has demonstrated that participation in Schools Attuned effected a significant change in four dimensions of teacher self-efficacy. While the experimental group reported a slight efficacy decline ranging from 4% to 9% at the time of the

follow-up test when compared to their post-test scores,

their follow-up efficacy remained significantly stronger

when compared with their pre-test efficacy. Participation

in Schools Attuned strengthened their teaching efficacy

which remained significantly stronger six months later at

the follow-up test. The control group evidenced no

significant change between their pre-test and their follow-

up tests. These findings and recommendations for future

research will be discussed in Chapter 5.

CHAPTER V

DISCUSSION

<u>Summary of the Study</u>

<u>Overview</u>

In the pursuit of excellence in the field of
education, attention is being directed towards two areas:
(1) scientifically research-based continuing professional
development programs and (2) the relationship between
highly qualified teachers and student achievement.
Continuing professional development is a plan of
professional development that extends beyond the
traditional one-day workshop. Highly qualified teachers
characteristically are knowledgeable about subject matter,
use effective instructional strategies, and have strong
self-efficacy for managing less structured classrooms to
meet the needs of diverse learners (Darling-Hammond, 1999a;
Giovannelli, 2003; Southeast Center for Teaching Quality
2004; Tomlinson, 2004). The concept of self-efficacy stems
from Bandura's (1977, 1986, 1997) social cognitive learning
theory and focuses on the strength of peoples' beliefs in
their capability to perform a specific goal-related task or
tasks. The stronger the self-efficacy, the greater the

possibility people will attempt and successfully perform the task. Teacher self-efficacy has been defined as teachers' beliefs that even difficult and unmotivated students are able to learn and can be taught (Guskey & Pessaro, 1994).

Almost three decades of research have revealed the positive relationship between strong teacher self-efficacy and high student achievement. Teacher self-efficacy has been shown to be a powerful predictor of student self-efficacy and achievement across grade levels and subject areas (Pajares, 2002a). Teachers who feel less efficacious about their abilities to complete the tasks needed for effective teaching are less likely to have effective teaching skills and harmonious relationships with their students than teachers who feel highly efficacious (Ashton & Webb, 1986; Tschannen-Moran & Woolfolk Hoy, 1998). Teachers with low self-efficacy model their beliefs and "undermine students' cognitive development as well as students' judgments of their own capabilities" (Pajares, 2002a, p. 122) while teachers with high self-efficacy exhibit affirmative behaviors that strengthen student efficacy and improve student learning.

Schools Attuned, a continuing professional development program developed by Mel Levine, M. D., was offered to

Oklahoma public school educators. This program helps

educators understand learning differences as impacted by

eight neurodevelopmental categories of brain functions. A

system to identify and manage student strengths and

weaknesses is provided through the 6-day Core Course and an

additional 10 hours of Practicum or follow-up during the

school year.

The purpose of this study was to measure the effect of

the Schools Attuned professional development program on the

participants' self-efficacy for student engagement,

instructional strategies, classroom management, and for

implementation of Schools Attuned. Although the

relationship of teachers' self-efficacy to student

achievement is well-known, there have been no published

studies about the efficacy of Oklahoma public school

educators who are participants in Schools Attuned compared

with a control group. There have been no published studies

of Oklahoma educators' efficacy for student engagement,

instructional strategies, and classroom management using

the Teacher Sense of Efficacy Scale (TSES).

This study utilized a quasi-experimental repeated

measures time-series design with a control group. Four null

hypotheses guided the study, that there is no difference

between the experimental group and the control group in

efficacy for Student Engagement, Instructional Strategies, Classroom Management, and Implementation of Schools Attuned. Study participants were 183 teachers, administrators, and counselors from public elementary and secondary schools in northeast Oklahoma. Including both groups of participants, almost 90% were women, 70% of whom worked at the elementary school level. Teachers comprised 85% of the total group with the remainder being administrators and counselors. The experimental group consisted of 131 educators who volunteered and registered online during the spring of 2003 to participate in the year-long Schools Attuned program, the summer Core Course and 10 hours of school-year follow-up. The 52 members of the control group volunteered to participate in the study in the fall of 2003 but had never registered for or attended the Schools Attuned program. The experimental and control groups were tested but not simultaneously on three different occasions.

The experimental group was pre-tested at pre-Schools Attuned Course meetings in April and May, 2003. On average, they were post-tested 8 weeks later in June and July 2003 near the completion of the 6-day Core Courses offered at three regional training sites. The control group was pre-tested in September 2003. On average, this

group was post-tested four weeks later at the mid-fall semester point. Both the experimental group and the control group were follow-up tested in early December 2003 during school visits. On average, the experimental group was follow-up tested 17 weeks after the post-test. On average, the control group was follow-up tested 4 weeks after the post-test. The Core Course Inventory was administered to both groups three times.

The Core Course Inventory consisted of two scales: (1) the 24 item Teacher Sense of Efficacy Scale (TSES) (Tschannen-Moran & Woolfolk Hoy, 2001) and (2) 17 similarly constructed items related to Schools Attuned developed by the researcher. The three subscales of the TSES are titled Student Engagement, Instructional Strategies, and Classroom Management. Also included in the survey were 6 demographic items which addressed ethnicity, age, gender, years of experience in education, position (teacher, counselor, or administrator), and grade level (elementary or secondary).

The Ohio State researchers reported the reliabilities of the three TSES subscales were established by using Cronbach's alpha. For the Schools Attuned items, content validity was determined by an expert panel. Construct validity of the Schools Attuned items was determined by factor analysis yielding one efficacy scale, Implementation

of Schools Attuned. Reliability of the Schools Attuned

scale was also computed using Cronbach's alpha. All

analyses were conducted using the computer software SPSS.

Statistical Analyses

The efficacy scores from the pre-tests, post-tests,

and follow-up tests of both the experimental and control

groups were analyzed using a repeated measures multivariate

analysis of variance (MANOVA) at an alpha level of .05.

The Greenhouse-Geisser correction was adopted for all of

the repeated measures analyses based upon the violation of

the assumption of sphericity. To determine differences in

the time by group interactions over three time points, the

linear and quadratic trajectories were examined.

Findings

A two (treatment vs. control) by three (pre-test,

post-test, follow-up test) repeated measures MANOVA was

conducted on the Core Course Inventory to examine the four

null hypotheses. The multivariate analysis was found to be

significant (p < .001) as were the univariate analyses

(p < .001) for each of the three subscales of the TSES and

the Implementation of Schools Attuned scale. The partial

η^2 indicated that participation in Schools Attuned explains

16% of the variance in Student Engagement efficacy, 14% of

the variance in Instructional Strategies efficacy, 13% of

the variance in Classroom Management efficacy, and 31% of the variance in Implementation of Schools Attuned efficacy. Two planned polynomial contrasts were examined for each dimension of efficacy to determine how the groups differed over time. The linear and quadratic contrasts were found to be significant ($p < .001$) for the three TSES subscales and for the Implementation of Schools Attuned scale.

For the three TSES subscales Student Engagement, Instructional Strategies, and Classroom Management, the experimental group scored lower than the control group at the pre-test, but scored higher than the control group on the post-test, and both groups scored similarly at the follow-up test. For the scale Implementation of Schools Attuned, the experimental group scored lower than the control group at the pre-test, but scored higher than the control group on the post-test, and scored higher than the control group on the follow-up test. Based upon the evidence of significant differences between the two groups on the TSES subscales and the Implementation of Schools Attuned scale, the four null hypotheses were rejected.

Discussion

The results of this study demonstrate that participation in Schools Attuned generated significant differences over time between the experimental and control

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groups on four dimensions of teacher efficacy. The

graphical results of the linear and quadratic contrasts for

the three subscales of the TSES and the Implementation of

Schools Attuned scale evidenced a clear 'cross-over'

pattern as the experimental group started out lower than

the control group on the pre-test and was above the control

group at the post-test. This crossover pattern is "the

clearest pattern of evidence for the effectiveness of the

program . . .. If you happen to find that kind of result,

you really have a program effect that has beat the odds"

(Trochim, 2002). Participation in Schools Attuned

alleviated the low self-efficacy felt at the pre-test and

participants felt recharged and highly efficacious at the

post-test. This change was also reported in the

participants' written reflections.

Post-Test Efficacy

The reflections of all Schools Attuned participants

are collected at the conclusion of each day. Approximately

15 minutes is provided on a daily basis for participants to

reflect on the day's experiences and learning. A

carbonless form is provided on which participants write

their thoughts. The participants keep one copy and the

Course facilitators keep the second copy. On the final day

of the Course, reflections were collected in an "I used to

think. . ., Now I think. . ." format. Participants'
responses included these comments:

> ". . . It is thrilling to know that we <u>can</u> make
> a difference with students!" And, "I used to
> think that my 'bag of tricks' was insufficient
> and running low. Now I can make a difference!
> My kids can be successful and my bag of tricks
> is virtually limitless."

Schools Attuned participation effected significant change
in educators' beliefs about their teaching capabilities,
strengthening teacher efficacy.

<u>Follow-up Test Efficacy</u>

For the follow-up test the experimental group reported
a slight efficacy decrease in the three TSES subscales so
the experimental group looked similar to the control group.
The experimental group efficacy slightly decreased on the
subscales Student Engagement, Instructional Strategies, and
Classroom Management. The crossover pattern was still
visible graphically for Student Engagement; however, there
was no statistical significant difference between the
experimental group and the control group for those three
dimensions of efficacy.

For the Implementation of Schools Attuned scale the
crossover pattern decreased slightly but the experimental
group efficacy remained significantly higher at the follow-
up test than the efficacy of the control group.

Participation in the Schools Attuned Core Course and in the follow-up sessions effected significant long-term change in educators' efficacy to understand, identify, and manage learning differences in the classroom. Because the goal of professional development is to produce continuous improvement, several explanations for the experimental group's slight efficacy decline will be discussed.

Transfer of Learning

The decline in efficacy experienced and reported by the Schools Attuned participants is not unusual. People may feel less assured while implementing new knowledge and skills. For example, only 10% of the approximately $100 billion spent by U.S. industry on training and development results in training transfer to the workplace (Baldwin & Ford, 1988, p. 63). Implementation occurs under the real-world conditions of school rather than under the perfect conditions of training. While the ideal is that new learning and skills are smoothly implemented at work, in reality there are numerous barriers that negate effective and long-term transfer of learning (Taylor, 2000). Two factors affecting the transfer of learning are (1) the personal characteristics of the participants and (2) the environment of the workplace (Baldwin & Ford, 1988; Taylor,

2000, p. 65). These two factors may have affected the participants in this study.

Participant Characteristics

The personal characteristics that may affect learning transfer include ability, motivation, and self-efficacy (Campbell & Pritchard, 1976; Peterson & Arnn (in press)). The Schools Attuned participants demonstrated the first characteristic of general teaching ability as members of a profession. All educators possess certain abilities such as prior education, skills, and knowledge of student engagement, instructional strategies, and classroom management in order to remain in their positions. Such abilities are maintained through participation in continuing professional development. However, the knowledge of the Schools Attuned principles and system of identification would be dependent upon participation in the Schools Attuned Course. The educators in this study also demonstrated the second personal characteristic of motivation.

The study participants volunteered, but were not randomly assigned, to participate in the experimental and control groups. People who volunteer may be responding to internal rather than to external motives such as time off or an increase in salary. Educators are believed to be

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internally motivated by the desire to make a difference in the lives of their students, sometimes under dire working conditions (Cooney, 2002), rather than by the desire to earn high salaries. For example, although some districts provided their Schools Attuned participants a stipend that could cover travel expenses, daycare for their minor children, or meals, most districts did not. Additionally, the experimental group relinquished 6 days of their summer vacation time and 10 hours during the school year to participate in Schools Attuned.

The educators in the experimental group may have chosen to attend Schools Attuned to learn more about understanding and managing student learning differences. They possessed ability and motives that did not involve financial gain. As adult learners, they set their own goals, planned a course of action to achieve them, and then executed the necessary actions to bring their plans to fruition (Bandura, 1997; Knowles, 1998). The third personal characteristic of self-efficacy was exhibited by both the experimental and the control groups.

Without some teaching efficacy, the tasks of teaching would not have been attempted and teachers would not be in the classroom. Upon completion of the study, a comment by a control group member regarding Schools Attuned was

overheard, "I don't know what a lot of that meant, but if any of it involves a computer, I can do it." While this participant was overhead commenting about Schools Attuned, he or she was expressing his or her efficacy. People must have self-efficacy for the task before it will be attempted (Bandura, 1997). The experimental group's efficacy decline may also have been affected by the workplace environment.

Workplace Environment

The second factor affecting transfer of learning is the workplace environment. Research demonstrates that poor communication between the administrators and the faculty, general low morale at the school, or lack of encouragement may affect the transfer of new knowledge and skills (Taylor, 2000, p. 12). Participants may not attempt to implement new learning if they believe no one around them is concerned that it is implemented (Newstrom, 1986). Principals and other administrators who do not express interest in their teachers or who are only perceived as being disinterested and non-supportive contribute to low morale and low learning transfer.

Although Schools Attuned requests that an administrator attend the Core Course as part of a school team of four to six educators, administrators may not always comply. Some administrators register but do not

attend the Core Course as emergencies arise or there are unexpected time conflicts. If these situations are perceived by their teachers as a lack of administrative support for efforts to implement Schools Attuned, the result may be a decrease in teacher efficacy and less transfer of learning for both the individual teacher and for the school team during the school year.

Other workplace situations that contribute to lack of learning transfer are the lack of implementation time during the school day and the lack of authority or approval to implement new learning (Taylor, 2000). Even if participants attend with a team that includes an administrator and are willing to implement Schools Attuned, their best intentions may be constrained by lack of time. The goal is for educators to be in the classroom with students during the day rather than to attend professional development programs or meetings that may interfere with learning and instruction. Educators may need administrative permission to implement any program in their classrooms. Teachers who attend Schools Attuned but whose administrators are unaware of their interest and involvement may find their implementation efforts superseded by other programs.

The Model of Professional Growth

The slight efficacy decrease at the follow-up test for the experimental group may also be explained by the U-curve model of professional growth. The U-curve model posits that experienced teachers become novices while experiencing new learning, then "get over their difficulties and gain a higher level of expertise than they possessed prior to entering" the professional development program (Mevarech, 1995, p. 167). Even expert teachers may experience setbacks, feel less efficacious as they implement new learning, and "hold their efficacy beliefs in a provisional status, testing their newly acquired knowledge and skills before raising their judgments of what they are able to do" (Bandura, 1997, p. 83; Guskey, 1984; Mevarech, 1995; Ross, 1998).

Perhaps the Schools Attuned participants' decrease in efficacy half-way through the year at the follow-up test was normal as the educators were near or at the bottom of the U-curve. As the year progressed, their efficacy may have been strengthened as practice made implementation easier and positive results in student learning were observed. Teacher efficacy may have increased as they moved up the U-curve. Examining experience was beyond the scope of this study, yet experience seems to be an

important variable that warrants examination in future studies. Future research may verify the professional development model in relation to Schools Attuned.

Implications and Future Research

The implications of this study must be understood in relation to the study limitations. Borko (2004) recommends that program effectiveness be first examined at one site in terms of four elements: (1) educators as participants; (2) the program facilitators; (3) the context in which the program is delivered; and (4) the program itself (p. 4). The second phase of evaluation examines if the program can be delivered "with integrity" at various sites by various providers or facilitators. The third phase compares the effect of one program with the effect of multiple programs.

The Educators as Participants

For this study, Oklahoma educators from 42 rural and urban schools at three training sites in northeast Oklahoma were examined. Future single-site evaluations of Schools Attuned may establish a solid foundation upon which to compare future studies. Additional research to examine the effect of Schools Attuned on educators in other regions of Oklahoma, in other states, and in Canada and Switzerland where Schools Attuned is available is also needed.

This study utilized teacher self-reports as the only measure of efficacy. Demographic information was also collected to describe the sample; however, participant characteristics were not examined in relation to program effectiveness. Qualitative studies may add rich detail and more objectivity especially if classroom observations were to be conducted. Demographic analyses may also reveal that years of experience in education and participants' ages somehow influence the participants' efficacy.

Although years of experience and participant age do not always make for an effective teacher (Arlin, 1999), educators with 20 years of classroom experience often have developed many strategies to manage their classrooms and assist students and parents. Experienced teachers are often better contributors to deep discussions at the Schools Attuned Course. On occasion, inexperienced teachers have stated that they are unaware of effective strategies and management methods during Schools Attuned discussions. Consequently, it may be necessary for information to be directly conveyed to inexperienced teachers rather than to be facilitated. Facilitation involves collaboration and drawing upon the wealth of experiences of the participants in discussions. Future research to examine participant characteristics related to

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program effectiveness and related to Schools Attuned facilitation would contribute needed information.

The Program Facilitators

Facilitators comprise the second element of a professional development program. Facilitation involves leveraging the program objectives with the learning needs of the participants rather than rigidly following a program script (Borko, 2004, p.12). Skilled facilitators guide other adults in reflecting about their practice and in exploring alternative ways of thinking and behaving in an atmosphere of mutual respect (Brookfield, 1986). To ensure participant comprehension of the neurodevelopmental concepts and for the consistency of program delivery across training sites, Schools Attuned is scripted for facilitation.

For this study, Schools Attuned was facilitated by 9 facilitators with zero to seven years of Schools Attuned facilitation experience. The facilitators taught elementary and high school students during the school year and facilitated Schools Attuned during the summer. The adjustment from teaching elementary students to facilitating adult learners may have been daunting to some facilitators consequently influencing their facilitation

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skills and participant efficacy. Future research is needed

to examine the effect of facilitation variance.

Future studies are needed for the second phase

evaluations to examine the "integrity" of Schools Attuned

as delivered at various sites by various facilitators

(Borko, 2004). The examination of the integrity of Schools

Attuned will require the development of instruments that

will disaggregate the efficacy effect of facilitators who

follow the script compared with those facilitators who

attempt to balance the script and participant learning

needs.

The Program Context

In evaluating the third program element, context, the

effect on efficacy of the locations at which Schools

Attuned is provided should be examined in future research.

For example, whether the air conditioning is functional and

cold water available during a summer workshop may influence

program effectiveness. For this study, Schools Attuned was

hosted in summer workshops at traditional school sites, in

college classrooms, and in a professional development

center. The follow-up meetings were held in school

classrooms and at a professional development center. It is

unknown whether attending Schools Attuned at a new college

facility influenced efficacy differently than hosting the

program at the traditional school site or professional

development center.

The Program Design

The program itself is the fourth element to be

evaluated (Borko, 2004). Program design elements include

the content, strategies or approaches, and materials and

media (Fishman, Marx, Best, & Tal, 2003). Design elements

of Schools Attuned include the organization of content into

units or modules based upon the categories of

neurodevelopmental function; daily participant reflection;

the script from which the program is facilitated; the

interaction with colleagues and facilitators; the

utilization of videos, materials for hands-on activities,

and printed materials; required use of the Internet; and

the follow-up sessions during the school year. Future

research is needed to determine whether certain Schools

Attuned program elements are more effective than others in

empowering educators. For example, in some areas of

northeast Oklahoma Internet access is not available for

educators in their classrooms nor do all educators have

computers in their homes. This element of Schools Attuned

may have less impact on efficacy than other elements.

In this study, efficacy for the experimental group

decreased at the follow-up test. The timing and duration

of the follow-up or Practicum sessions may have influenced the efficacy decrease in some manner. Future research may examine whether school-year support for educators is more effective if Practicum sessions were longer than two hours or if sessions were offered more frequently than every 6 to 8 weeks. Also to be discovered is the possible benefit of providing implementation support from within educators' schools through on-site coaching. Longitudinal studies to examine teacher efficacy fluctuations during the implementation of new programs are needed.

However, the examination of program effects on educators is only one facet of total program evaluation (Fishman, Marx, Best, & Tal, 2003). The assessment of change in classroom practice after participation in Schools Attuned is needed. The goal of professional development is to change educators' knowledge, beliefs, and attitudes which are closely related to their classroom practice (Richardson, 1996). Longitudinal studies with control groups to examine whether there is a "trickle-down" effect of Schools Attuned on student efficacy and performance would contribute valuable information.

With the focus on accountability, the most sought-after evaluations may be the third phase multiple program comparisons. The comparison of multiple programs' effects

on teachers and student achievement would provide the
desired scientifically research-based data on continuing
professional development programs. Other recommendations
for future research are to examine the effect of Schools
Attuned on teacher efficacy at different stages of the
teaching career and to examine collective efficacy at
schools where the entire school has received Schools
Attuned training.

Summary

The No Child Left Behind Act has focused national
attention on the importance of educators' participation in
effective continuing professional development programs.
Effective programs alter teachers' attitudes, beliefs, and
perceptions about teaching and learning which are believed
to improve students' learning (Guskey, 2002). These
programs strengthen teacher efficacy or the beliefs that
teachers can individually and generally successfully
complete the tasks of teaching (Bandura, 1997). Three
important tasks of teaching are the ability to (1) motivate
all students, (2) provide effective instructional
strategies for all students, and (3) control a classroom
(Bandura, 1997; Tschannen-Moran & Woolfolk Hoy, 2001).
Highly efficacious teachers transmit their efficacy to

their students, thereby improving student efficacy and student performance (Ashton & Webb, 1986; Pajares, 2002a).

This study examined Schools Attuned, a continuing professional development program for educators (AKOM, 2000). Schools Attuned is a year-long program that addresses the diagnosis and management of student learning differences in the regular education classroom. Participants attend an initial 6-day Core Course followed by five 2-hour sessions held during the school year. Schools Attuned uses the adult learning principles of andragogy, constructivism, and reflection-on-action.

Andragogy acknowledges that adult learners are self-directed, internally-motivated individuals with valuable prior experiences and knowledge who want to put new knowledge to immediate use to solve the problems in their lives (Knowles, 1998). Constructivism connects adults' prior knowledge and experiences in the development of new knowledge through the process of reflection (Merriam & Caffarella, 1999). Reflection allows adults to analyze problems and possible solutions without having to act immediately (Schon, 1983, 1987). These adult learning principles are demonstrated in the Schools Attuned program through a variety of school scenarios. These scenarios are designed to connect prior classroom experiences and

knowledge with new learning about the eight neurodevelopmental constructs and identifying and managing learning differences. Reflection after each scenario allows participants time to analyze and understand problems and to construct new solutions and management strategies.

This study found that Schools Attuned had a significant program effect for identifying, understanding, and managing learning for diverse learners for the experimental group when compared with the control group. Participation in the 6-day Schools Attuned Core Course and two of the school year follow-up sessions significantly strengthened teacher efficacy for implementation of Schools Attuned. Participation in the Core Course also significantly strengthened teacher efficacy for student engagement, instructional strategies, and classroom management; however, improvement in these three dimensions of efficacy was not maintained through the school year for the experimental group when compared with the control group. It is recommended that more funding be provided for increased participant support during the school year to maintain the significant gains achieved at the Core Course. This support could follow various formats.

To be effective, professional development programs should promote gradual but real change in teaching (Guskey

& Huberman, 1995). Although the National Staff Development Council (2000) recommends that 25% of the school day be reserved for educator collaboration, this has not occurred. Because time is not provided during the school day, most professional development occurs after school has dismissed when educators are tired after having worked all day. Over half of all educator professional development programs are less than 8 hours in duration and are not effective (Sparks & Hirsch, 2000). School district administrators must provide time during the school day for educator professional development and collaboration.

To be effective, professional development programs should include long-term support in the classroom (Pritchard & Marshall, 2002). After participation in professional development, time must also be provided during the school day for collaboration with colleagues to facilitate implementation of new knowledge and skills. Implementation of new learning and skills takes time to practice, to analyze the effect on student learning, to balance with other teaching responsibilities, and to problem-solve as difficulties arise (Guskey, 1995).

Specific to Schools Attuned and the findings of this study, educators would benefit from additional follow-up sessions held during the school year. The five school-year

sessions already in place focus on selected topics such as reading and writing as impacted by the eight neurodevelopmental constructs. Additional monthly follow-up sessions or adult learning groups should be unstructured and open to group discussions of topics that meet the immediate needs of the participants. Following adult learning principles, participants should be very involved in the learning process, working on projects that reflect their interests related to Schools Attuned, and assuming responsibility for group leadership and presentations (Knowles, 1998).

Additionally, on-site coaching programs should be implemented for all participants during the school year. Site visits are already provided by thoroughly trained Schools Attuned personnel. However, site visits are frequently perceived by participants as evaluations of performance rather than as sources of support and encouragement. In general, participants do not avail themselves of the expertise of the Schools Attuned personnel. Considering that effective professional development is teacher and classroom specific (Guskey & Huberman, 1995), on-site coaching programs would provide encouragement and assistance with implementation of Schools

Attuned based upon the needs of the individual teacher, classroom, and school.

To promote participation in a coaching program, each participant could be provided 500 coaching "dollars" at the completion of the Core Course to "spend" on visits or conferences with Schools Attuned personnel during the school year. This promotion could alter the perception of Schools Attuned personnel from performance evaluators to supportive coaches with participants more willing to request visits. These opportunities would provide more support during the school year, assisting in the maintenance of the strong teacher efficacy developed at the Schools Attuned Core Course.

Efficacy is not constant but is influenced by thoughts, emotions, beliefs, and behaviors in various situations (Bandura, 1997). Consequently, changes in teacher efficacy are best examined over time prior to and following professional development participation. We have much to learn about how teacher efficacy is strengthened, how to design measures that examine the scope of teaching tasks, and how efficacy is related to student achievement. Research to learn more about teacher efficacy can only enhance the future for all teachers and students. This study suggests that Schools Attuned is a promising

professional development program for educators that merits

further research to determine its impact on student self-

efficacy and learning.

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APPENDIXES

APPENDIX A: THE CORE COURSE INVENTORY

Directions: This questionnaire is designed to help us gain
a better understanding of the kinds of things that create
difficulties for teachers in their school activities. Please
indicate your opinion about each of the statements below
Your answers are confidential.

How much can you do?

	No Influence	A Tiny Bit of Influence	Very Little Influence	Little Influence	Some Influence	Slightly More Influence	Quite A Bit of Influence	A Lot of Influence	A Great Deal of Influence
1. How much can you do to get through to the most difficult students?	0	1	2	3	4	5	6	7	8
2. To what extent can you identify students' weaknesses in mental energy controls?	0	1	2	3	4	5	6	7	8
3. How much can you do to help your students think critically?	0	1	2	3	4	5	6	7	8
4. To what extent can you construct a student's neurodevelopmental profile?	0	1	2	3	4	5	6	7	8
5. How much can you do to control disruptive behavior in the classroom?	0	1	2	3	4	5	6	7	8
6. How well can you manage learning differences in concept formation?	0	1	2	3	4	5	6	7	8
7. How much can you do to motivate students who show low interest in school work?	0	1	2	3	4	5	6	7	8
8. To what extent can you identify students' weaknesses in saliency determination?	0	1	2	3	4	5	6	7	8
9. To what extent can you make your expectations clear about student behavior?	0	1	2	3	4	5	6	7	8
10. How much can you do to strengthen students' development of their own areas of expertise?	0	1	2	3	4	5	6	7	8
11. How much can you do to get students to believe they can do well in school work?	0	1	2	3	4	5	6	7	8

	How much can you do?								
	No Influence	A Tiny Bit of Influence	Very Little Influence	Little Influence	Some Influence	Slightly More Influence	Quite A Bit of Influence	A Lot of Influence	A Great Deal of Influence
12. To what extent can you identify students' weaknesses in phonological processing?	0	1	2	3	4	5	6	7	8
13. How well can you respond to difficult questions from your students?	0	1	2	3	4	5	6	7	8
14. To what extent can you provide management strategies to strengthen students' weaknesses at the discourse level?	0	1	2	3	4	5	6	7	8
15. How well can you establish routines to keep activities running smoothly?	0	1	2	3	4	5	6	7	8
16. To what extent can you provide management strategies to strengthen students' interpersonal skills?	0	1	2	3	4	5	6	7	8
17. How much can you do to help your students value learning?	0	1	2	3	4	5	6	7	8
18. To what extent can you describe observable phenomena in the classroom?	0	1	2	3	4	5	6	7	8
19. How much can you gauge student comprehension of what you have taught?	0	1	2	3	4	5	6	7	8
20. To what extent can you access the online Learning Base for Schools Attuned resources?	0	1	2	3	4	5	6	7	8
21. To what extent can you craft good questions for your students?	0	1	2	3	4	5	6	7	8
22. How well can you accommodate learning differences in graphomotor functioning?	0	1	2	3	4	5	6	7	8
23. How much can you do to foster creativity?	0	1	2	3	4	5	6	7	8
24. To what extent can you provide management strategies to strengthen students' weaknesses in self-regulation?	0	1	2	3	4	5	6	7	8

	How much can you do?								
	No Influence	A Tiny Bit of Influence	Very Little Influence	Little Influence	Some Influence	Slightly More Influence	Quite A Bit of Influence	A Lot of Influence	A Great Deal of Influence
25. How much can you do to get children to follow classroom rules?	0	1	2	3	4	5	6	7	8
26. How much can you do to help students understand their learning?	0	1	2	3	4	5	6	7	8
27. How much can you do to improve the understanding of a student who is failing?	0	1	2	3	4	5	6	7	8
28. To what extent can you provide management strategies to strengthen students' weaknesses in time management?	0	1	2	3	4	5	6	7	8
29. How much can you do to calm a student who is disruptive or noisy?	0	1	2	3	4	5	6	7	8
30. To what extent can you provide interventions for students' weaknesses in spatial ordering?	0	1	2	3	4	5	6	7	8
31. How well can you establish a classroom management system with each group of students?	0	1	2	3	4	5	6	7	8
32. How well can you link classroom performance to the neurodevelopmental constructs?	0	1	2	3	4	5	6	7	8
33. How much can you do to adjust your lessons to the proper level for individual students?	0	1	2	3	4	5	6	7	8
34. To what extent can you identify students' weaknesses in organizational skills?	0	1	2	3	4	5	6	7	8
35. How much can you use a variety of assessment strategies?	0	1	2	3	4	5	6	7	8
36. How well can you keep a few problem students from ruining an entire lesson?	0	1	2	3	4	5	6	7	8
37. To what extent can you provide an alternative explanation or example when students are confused?	0	1	2	3	4	5	6	7	8

	How much can you do?								
	No Influence	A Tiny Bit of Influence	Very Little Influence	Little Influence	Some Influence	Slightly More Influence	Quite A Bit of Influence	A Lot of Influence	A Great Deal of Influence
38. How well can you respond to defiant students?	0	1	2	3	4	5	6	7	8
39. How much can you assist families in helping their children do well in school?	0	1	2	3	4	5	6	7	8
40. How well can you implement alternative strategies in your classroom?	0	1	2	3	4	5	6	7	8
41. How well can you provide appropriate challenges for very capable students?	0	1	2	3	4	5	6	7	8

42. Please indicate your **total years of experience** in education (do **not** count substitute teaching) _____

43. Please indicate the **level and position** in which you currently work **more than 50%** of the time:

    ____**Elementary K-5**   _____**Secondary 6-12**
    Teacher _____   Teacher _____
    Counselor_____   Counselor_____
    Administrator _____   Administrator _____

44. Please indicate your **Nationality:** African American ____   Asian ____
    Hispanic____   Native American ____   White ____   Other ____

45. Please indicate your **Gender:** Male ____   Female ____

46. Please indicate your **Age:** _____

APPENDIX B: EXPERIMENTAL GROUP INFORMED CONSENT FORM

INFORMED CONSENT

The purpose of this study is to help us gain a better understanding of the kinds of things that create difficulties for teachers in their school activities. Although you will not receive nay immediate and direct benefits from this study, you may receive a summary of the results of the study, if desired. The research involves a pre-Schools Attuned Core Course survey, a post-Schools Attuned Core Course survey, and a follow-up survey to be completed in January, 2004. The study is being conducted in conjunction with Oklahoma State University.

If you consent to participate in this study, your name will not be associated with this research in any way. It is very important that you realize that:

1. Your participation in this study is voluntary.
2. You will not be penalized in any way if you choose not to participate, and
3. You are free to withdraw your consent to participate in this study at any time.
4. Your participation in this project will involve the completion of three 15-minute surveys. Should you be willing to be interviewed at a later date, the interview will be no longer than 45 minutes.
5. It is not anticipated that you will suffer any risks of discomfort or inconvenience from this participation.
6. No incentives will be provided for participation in this study.

The information you provide will remain confidential and will not be available to anyone other than the researcher.

If you have any questions about this study, you may contact Lynn Arnn who is the researcher. In addition, you may contact the IRB Office at Oklahoma State University, 415 Whitehurst Hall, Stillwater, Ok 74087, Phone: (405) 744-5700.

My signature below confirms that I have read and understand the contents of this consent form.

Please Print Name: _____ Date: _____

Signature: _____

If you are interested in being interviewed, please include your email address and phone number.

Email: _____ Phone: _____

APPENDIX C: CONTROL GROUP INFORMED CONSENT FORM

INFORMED CONSENT

The purpose of this study is to help us gain a better understanding of the kinds of things that create difficulties for teachers in their schools activities. Although you will not receive any immediate and direct benefits from this study, you may receive a summary of the results of the study, if desired. The research involves a pre-survey, a post survey, and a follow-up survey to be completed by January, 2004. The study is being conducted in conjunction with Oklahoma State University.

If you consent to participate in this study, your name will not be associated with this research in any way. It is very important that you realize that:

1. Your participation in this study is voluntary.
2. You will not be penalized in any way if you choose not to participate, and
3. You are free to withdraw your consent to participate in this study at any time.
4. Your participation in this project will involve the completion of three 15-minute surveys. Should you be willing to be interviewed at a later date, the interview will be no longer than 45 minutes.
5. It is not anticipated that you will suffer any risks of discomfort or inconvenience from this participation.
6. No incentives will be provided for participation in this study.

The information you provide will remain confidential and will not be available to anyone other than the researcher.

If you have any questions about this study, you may contact Lynn Arnn, who is the researcher. In addition, you may contact the IRB Office at Oklahoma State University, 415 Whitehurst Hall, Stillwater, Ok 74087, Phone: (405) 744-5700.

My signature below confirms that I have read and understand the contents of this consent form.

Please Print Name: _____Date:_____

Signature: _____

If you are interested in being interviewed, please include your email address and phone number.

Email: _____Phone:_____

APPENDIX D: THE INSTITUTIONAL REVIEW FORM

Oklahoma State University
Institutional Review Board

Protocol Expires: 12/1/2004

Date: Tuesday, December 02, 2003   IRB Application No   ED0466

Proposal Title: The Effect of "Schools Attuned" on Teacher's Perceptions of Self-Efficacy

Principal Investigator(s):

Royalyn Amn   Gary J Conti
                                     206 Wlllard
Tulsa, OK   Stillwater, OK 74078

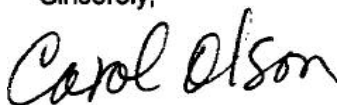Approval Status Recommended by Reviewer(s): Approved

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Dear PI:

Your IRB application referenced above has been approved for one calendar year. Please make note of the expiration date indicated above. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved projects are subject to monitoring by the IRB. If you have questions about the IRB procedures or need any assistance from the Board, please contact me in 415 Whitehurst (phone: 405-744-5700, colson@okstate.edu).

Sincerely,

Carol Olson

Carol Olson, Chair
Institutional Review Board

VITA

Royalyn B. Arnn

Candidate for the Degree of

Doctor of Education

Thesis: THE EFFECT OF THE SCHOOLS ATTUNED PROGRAM
               ON EDUCATORS' SELF-EFFICACY

Major Field: Occupational and Adult Education

Biographical:

Education: Received a Bachelor of Arts degree in
Psychology from Westminster College, Salt Lake City, Utah,
May, 1968; received a Bachelor of Science degree in
Education/German from Chadron State College, Chadron,
Nebraska, January, 1970; received a Master of Arts degree
in Educational Administration from the University of
California, Riverside, May, 1989; Completed the
requirements for the Doctor of Education degree at Oklahoma
State University, Stillwater, Oklahoma in May, 2005.

Experience: Learning Coach, Lindsey Academy, Tulsa
Public Schools; Northeast Regional Coordinator, Schools
Attuned in Oklahoma, 2002-2005; Elementary Teacher, Tulsa
Public Schools 1990-2002; Moreno Valley, California, Moreno
Valley Unified School District, 1988-1990;Private practice
providing prescriptive learning programs to children and
adults, 1994-present.

Professional Memberships: Phi Kappa Phi Honor Society;
International Dyslexia Association; American Educational
Research Association; Rocky Mountain Educational Research
Association; Association for Supervision and Curriculum
Development; The American Association for Adult and
Continuing Education.

Name: Royalyn B. Arnn   Date of Degree: May, 2005

Institution: Oklahoma State University   Location:
Stillwater, Oklahoma

Title of Study: THE EFFECT OF THE SCHOOLS ATTUNED PROGRAM
                ON EDUCATORS' SELF-EFFICACY

Pages in Study: 212   Candidate   for   the

Degree of Doctor of Education

Major Field: Occupational and Adult Education

Scope and Method of Study: The purpose of this study was to
     analyze the effect of the Schools Attuned professional
     development program on educator self-efficacy. This
     study used a quasi-experimental longitudinal design
     with a control group. The Core Course Inventory was
     administered to both groups over three time periods. A
     repeated measures MANOVA was used to test four null
     hypotheses that there would be not change over time
     for either group in efficacy for student engagement,
     instructional strategies, classroom management, and
     implementation of Schools Attuned.

Findings and Conclusions: Analysis of the Inventory over
     tile illustrated that participants in the experimental
     group significantly increased in all four dimensions
     of efficacy from pre-test to post-test while the
     control group members did not change. Experimental
     group efficacy dropped slightly at the follow-up time
     point in three of the four efficacy dimensions. At the
     follow-up, no significant differences were found
     between the control group and the experimental group
     except in terms of Implementation of Schools Attuned.

ADVISER'S APPROVAL: Dr. Gary Conti