THE RELATIONSHIP BETWEEN THE SELF-PERCEIVED EFFECTIVENESS OF INTERDISCIPLINARY TEACHER TEAMS AND STUDENT ACADEMIC ACHIEVEMENT

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ABSTRACT

Middle level schools have embraced the organizational concept of interdisciplinary teaming and implemented practices of collaboration and teamwork to address academic, social, and emotional needs of students (Mertens & Flowers, 2004). However, concerns about mediocre academic performance of middle level students have interdisciplinary teaming under attack (Yecke, 2006). The following research questions were the focus of the study.

1. What is the relationship between the self-perceived effectiveness of an interdisciplinary team and student academic achievement?
2. Does the percentage of Low SES students (those receiving free and reduced price lunch) impact the relationship between the self-perceived effectiveness of an interdisciplinary team of teachers and student academic achievement?

The purpose of this study was to identify the relationship between the self-perceived effectiveness of interdisciplinary teacher teams and student academic performance. The hypothesis was that the more an interdisciplinary team perceives itself to be meeting the characteristics of effective interdisciplinary teams, the better its students would perform academically.

Seventh and eighth grade students in the Olathe District Schools made up the sample. The teachers selected for the study teach a core subject on an interdisciplinary team assigned to 7^{th} or 8^{th} grade students. Interdisciplinary team effectiveness was measured using The Interdisciplinary Team Audit. Olathe School District and Kansas reading assessment scores measured student academic performance. The data collected were calculated using SPSS software to determine descriptive statistics. Calculation of

the correlation coefficient of the data points determined the strength and direction of the relationship between the variables.

Research question 1 demonstrates a positive relationship that as teacher team self-perceived effectiveness survey score increased, Kansas assessment scores of the students also increased. The same is true between the self-perceived effectiveness of the teacher team instructional practices survey score and the Kansas assessment score.

Research question 2 revealed a negative, statistically significant relationship between the increased percentage of Low SES students and the decreased student reading assessment scores. In another calculation, as the percentage of Low SES students increased, the teacher teams' self-perceived effectiveness decreased at a statistically significant level.

This study builds on a promising base describing the potential positive impact interdisciplinary teams have on young adolescent development and academic achievement.

DEDICATION

This study is dedicated to my family and friends, who have been a continuous source of strength and encouragement during this process and throughout my personal and professional pursuits. In addition, a special dedication goes to my Mom, who always provided inspiration for my academic and professional endeavors. May she rejoice from heaven's doorstep as we celebrate this accomplishment.

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CHAPTER ONE

INTRODUCTION AND RATIONALE

Educational stakeholders question the rationale behind shifts in educational philosophies and practices, but a simple analogy is helpful in understanding such shifts. Picture a pendulum swinging back and forth from one side to the other. Educational theory and practice are similar to the swinging pendulum; strategies and schools of thought that are currently *en vogue* are often reactions to the strategies and schools of thought that preceded them. One of the shifts in educational practices is the implementation of teacher collaboration through organizational structures such as professional learning communities and interdisciplinary teaching teams. In the past, teaching relied on the teacher entering the classroom, closing the door and talking to the students (DuFour, 2004). Individually, teachers assessed student learning in their classroom and then moved on to the next unit, concept, or topic, regardless of student scores and demonstration of learning or lack of learning. Teaching consisted of individual effort and very little teamwork (DuFour, 2004). The swinging pendulum has brought about a change in the understanding of what effective collaboration looks like in the educational setting. According to researcher and author Richard DuFour (2004), educational collaboration begins as teams of teachers make an effort to improve classroom instruction and student learning by engaging in analysis to verify best instructional practices for increasing student academic achievement. He encouraged teacher teams to further move beyond comfortable conversations and take on conversations that were traditionally overlooked in the past. DuFour (2004) explained that true "collaborative conversations" require teachers to share successes and non-

successes, student learning data, and instructional plans and practices (p. 6). Collaboration in the educational setting is now focused on the very heart of student learning: classroom instructional strategies and individual student learning outcomes.

The collaborative movement has roots in the middle-school concept of interdisciplinary teaming. This structure provided educators from multiple content areas the opportunity to collaborate on educational practices, instructional strategies, and individual learning needs centered on a common group of students. Boyer and Bishop (2004) explained it this way:

> According to decades of research, successful teams in middle schools must be focused on the unique needs of young adolescents. These needs arise from the profound personal changes that 10- to 15- year-olds experience – changes in patterns of thinking, physical growth, hormones, emotions, morals, and friends (p. 12).

Meeting the needs of developing young adolescents and challenging them to achieve academically requires a collaborative, devoted team of teachers (Merenbloom, 1996). However, concern about the performance of middle-level students on academic achievement assessments has opponents attacking the middle-school philosophy and the component of interdisciplinary teaming. Opponents claim that performance of middle level students has been harmed by the attention to students' social development rather than a focus on academic achievement. To support this assertion, opponents use national data that report 40% of students leaving grades six through eight perform below basic levels in reading, math, and science (Southern Regional Education Board [SREB], 2001). Data from The National Assessment of Educational Progress also supports concerns

about the academic performance of middle-school students, reporting that only 28% of eighth graders performed at the proficient level on the 2000 mathematics assessment (SREB, 2001). Those who oppose the middle-school concept of interdisciplinary teaming contend that academic performance at the middle level has declined as a direct result of the shift in focus from intellectual development to social and emotional development (Yecke, 2006). These concerns regarding the academic performance of middle-level students have begun to swing the pendulum once again. Support for the middle-school organizational structure of interdisciplinary teaming is waning and interest in other models of educating young adolescents such as configuring schools in a K-8 organization or assigning students to a single teacher or to a single-sex classroom throughout the school day is rising (Yecke, 2006). No doubt, the pendulum will continue to swing back and forth regarding best educational practices. In order to ensure the swinging pendulum includes interdisciplinary teaming, middle level education activists must collect, document, and present additional data on the influence of effective interdisciplinary teaching teams and their positive impact on young adolescents' academic and social development.

Statement of the Problem

Schools serving students in grades six through eight, which have embraced the organizational middle-school concept of interdisciplinary teaming, have implemented the practices of collaboration and teamwork to address the academic, social, and emotional concerns of their students (Mertens & Flowers, 2004). However, the concerns about the mediocre academic performance of middle-level-grade students have the middle-school concept and interdisciplinary teaming under attack (Yecke, 2006). Assessment data from

the National Assessment of Educational Progress, as stated above, provide evidence to support the concerns about the ability of middle-level philosophy, current practices, and interdisciplinary teaming to meet the educational needs of this specific student population (SREB, 2001). In addition to academic performance concerns, there are a number of opponents who question the financial commitment to interdisciplinary teaming organizational structure because they feel such commitment is focused on students' social growth rather than on their academic growth (Yecke, 2006). This raised the question: Is there evidence to support the claim that interdisciplinary teaming makes a positive academic impact on students?

Background of School District

Olathe is located in the heart of Johnson County, Kansas, and receives students from several surrounding cities. "With a population of 125,225 [1/10] Olathe, Kansas was the second largest among the 21 communities in Johnson County, and the fourth largest city in the state" (City of Olathe, 2007, p.1). The July 2008 edition of *Money Magazin*e ranked Olathe as America's 11th best place to live, noting the city's growth as well as major employers such as Garmin, Farmers Insurance, ALDI and Honeywell (Money Magazine, 2008). As the city of Olathe continued to boast about increases in overall population, the local school district also demonstrated increases in enrollment as families continued to move into the district's boundaries. As a growing district, Olathe gains 500 to 700 new students each year. This dramatic increase in student population required the addition of both facilities and staff. Between the years of 2001 and 2008, approximately 300 new teachers were hired each new school year (Olathe District

Schools, 2010). These represent educators filling vacancies due not only to attrition, but also to newly created positions.

Student enrollment has increased steadily throughout the district's history. As noted in Figure 1, below, student enrollment increased more than six-fold in the 40 years from 1969 (4,433) to 2009 (27,225) (Olathe District Schools, 2010).

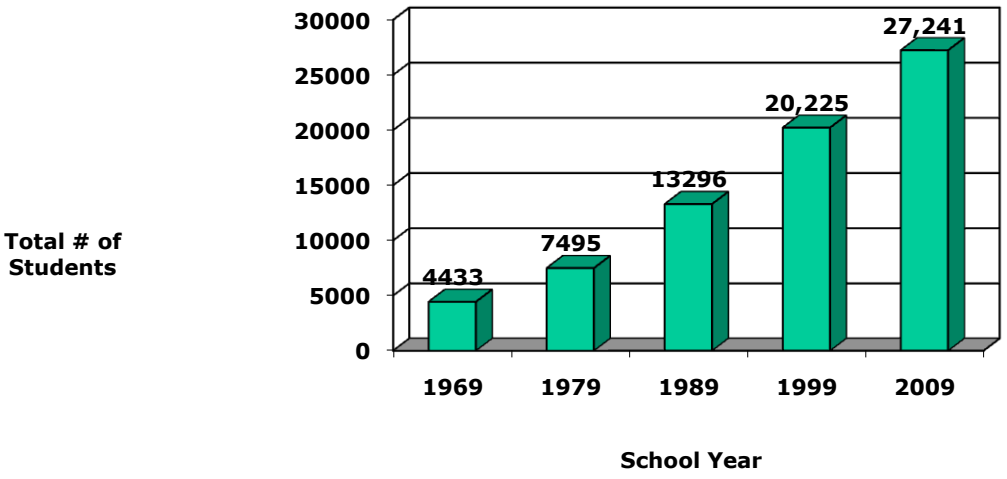

Figure 1. Growth in Total Student Population, Olathe School District, 1969-2009. Each bar on the graph represents a year and the total student population for that school year, Olathe District Schools, 2009

The Olathe student and community populations have become more diverse as they have grown. Figure 2, below, represents the distribution of student ethnicity in the district in 2007. Hispanic students in Olathe represent a larger percent of the student body than do African-American students.

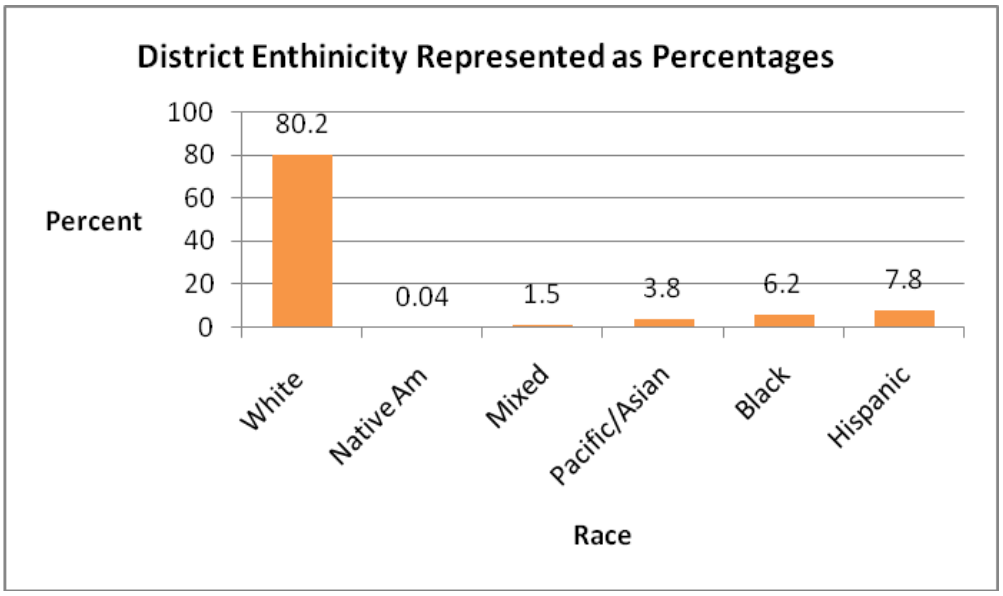

Figure 2. District Ethnicity Represented as Percentages at the Beginning of the 2007 School Year. Each bar on the graph demonstrates the percent of students representing the identified ethnicity.

Olathe District Schools, 2010, Enrollment Statistics; KSDE, 2010

The growing diversity of the Olathe student body has resulted in increased demand for programs to improve English literacy for new English Language Learners (ELL). These site-specific programs were created to increase ELL students' literacy in English through an immersion program with trained ELL staff and collaboration among all teachers at the site (McKeon, 1987). Figure 3, below, highlights the nearly 40 fold increase over the last 25 years. The increase is attributed to the growing diversity in the Midwest. A possible explanation for the growing diversity is the fact that Olathe participates in the sister-city program with Ocotolan, Mexico (City of Olathe, 2007). Adding to the growing diversity is that Olathe and the surrounding communities offer many job opportunities through large employers, such as Aldi, Honeywell, Black and Veatch, and UPS. Amazingly, 51 different languages are represented among the 1,961

ELL students in 2009. Among the languages represented are Vietnamese, Mandarin, Arabic, Wolf and Spanish (Olathe District Schools, 2010, Enrollment Statistics; KSDE, 2010).

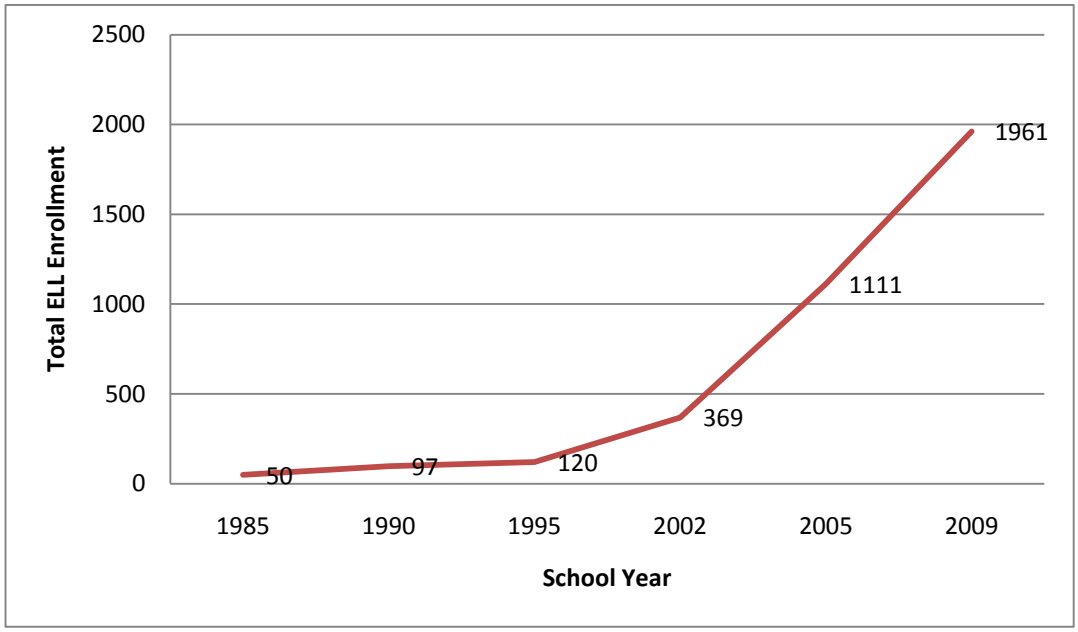

Figure 3. Number of English Language Learners. Demonstrates the growth of students with English as a second language between the years of 1985 and 2009

Olathe District Schools, 2010; KSDE, 2010

Student populations of interest, like English Language Learners, are also those students living in poverty. School districts use the number of students receiving free and reduced price lunches to estimate the number of students living in poverty. The Olathe school district has an average of 10.6% of the student population living in poverty (Olathe District Schools, 2010). Among the district's schools, there is a reported range from 0.7% to 63.4% of an individual school's student population receiving free or reduced price lunches (Olathe District Schools, 2010; KSDE, 2010).

In addition to students who speak languages other than English and students living in poverty, there is a group of students with identified learning, behavioral, or

physical needs which is also of interest to educators. The percentage of students (15%) identified with specific learning difficulties or other health impairments that lead to specialized education plans is shown in blue in Figure 4, below. The students (5%) identified as gifted have Individual Education Plans (IEP) and are shown in white on Figure 4 (KSDE, 2010).

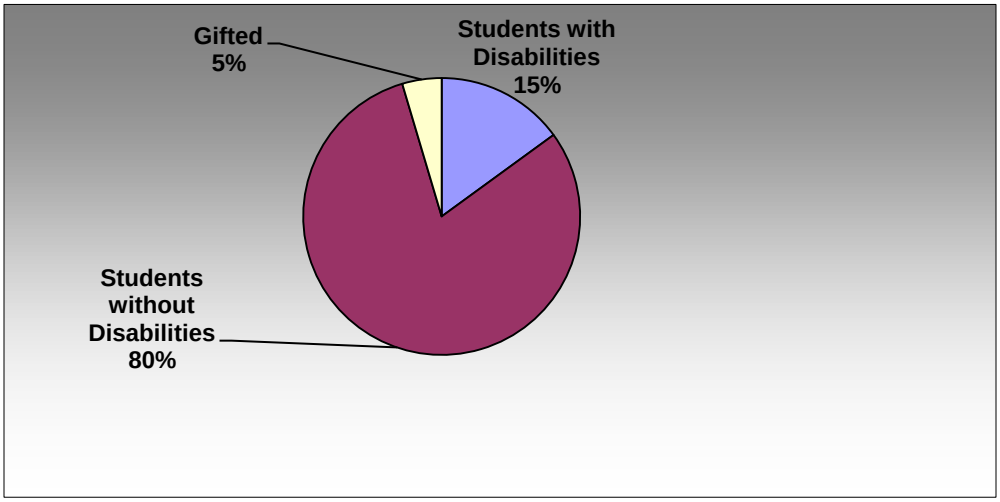

Figure 4. Student Population is demonstrated in the circle graph as a whole, with the percent of students with identified educational needs labeled and in blue and the percent of students identified as gifted labeled in white.

KSDE, 2010

A growing district such as Olathe must strive to meet the challenges associated with increasing student enrollment and growing diversity. Olathe's prosperity and rapid growth have enabled the implementation of innovative and best-practice educational programs such as ELL immersion site programs, interdisciplinary teaming at the middle level, and grade level transitional programs. Transitional programs specifically are designed to create opportunities for older students to mentor in-coming and new students as well as to decrease the stress and fears associated with transition to a new level of

schooling. The need for transitional programs and how these programs work with interdisciplinary teaming are discussed in greater depth in chapter two.

Conceptual Framework for the Study

Children between the ages of 10 and 15, known as young adolescents, display characteristics that are constantly changing and are commonly a cause for concern in teachers and parents (Center for Collaborative Education [CCE], 2002). This age group experiences physical changes, occurring as patterns of growth, which cause restlessness and increased need for movement (Boyer and Bishop, 2004; J. Berckemeyer [former Assistant Executive Director of the National Middle School Association], personal communication, April 17, 2009). According to Sue Swaim, former Executive Director of the National Middle School Association, young adolescents also display a variety of characteristics related to mental and emotional development, placing them at greater risk of engaging in poor decision making, risk–taking behaviors, and, at times, an appearance of defiance toward authority, as they test their boundaries and discover their interests, beliefs, and core values (S. Swaim, personal communication, April 13, 2007).

Responding to the challenges associated with the physical, mental, and academic changes experienced by young adolescents, schools have implemented middle level practices including interdisciplinary teacher teams to positively impact young adolescent development academically, socially, and physically. The practice of interdisciplinary teaming, most commonly found in grades six through eight, organizes students into smaller learning communities consisting of 80 – 120 students per team. Interdisciplinary teaching teams are most often comprised of one teacher from each of the four core academic subject areas (math, language arts, science, and history). According to the

National Middle School Association [NMSA] successful interdisciplinary teams function effectively because teams have an opportunity during the school day to collaborate on instructional plans, review student learning outcomes, and problem-solve together (NMSA, 2004).

Sharing common students throughout the school day allows a team of teachers to affect the learning environment in important ways. Students have an opportunity to build positive relationships with core teachers, and those relationships increase student perceptions of support, collaboration, and connectedness. Teachers can share and build on student successes in addition to making each other aware of areas of concern (Mertens & Flowers, 2004). Teams build a climate that supports learning by providing students with connections to peers and the curriculum. Climate building also includes implementing team activities that promote team-building processes, problem solving skills, and curriculum integration.

Lounsbury's (1996) list of characteristics of a developmentally responsive middle school includes: "high expectations for all, an adult advocate for every student, curriculum that is challenging, integrative, exploratory and delivered with a variety of approaches, and flexible organizational structures" (p. 3). The Carnegie Corporation and The National Middle School Association, leading organizations on the topic of middle-level education, promote an educational philosophy designed to meet the academic needs of young adolescents, which includes a variety of expectations, instructional strategies, organizational structures, and interdisciplinary teaming. Interdisciplinary teaming has been identified as a critical organizational structure and a vital piece in the education of middle-level students. Interdisciplinary Teaming "has enormous potential to meet the

academic and social needs of young adolescents as well as to increase the effectiveness, enjoyment, and professional development of [team] teachers" (Arnold & Stevenson, 1998, p. 1).

Purpose of Study

The purpose of this study was to identify the relationship between the self-perceived effectiveness of an interdisciplinary teacher team and student academic performance as measured by district and state reading assessments. Therefore, it is hypothesized that the more team teachers perceive themselves to be effective interdisciplinary teams, the greater their students' achievements will be on the district and state reading assessments.

Delimitations

The focus of this study centered on the relationship between 7th and 8th grade teachers' perceptions of the effectiveness of their work as an interdisciplinary team and the academic performance of students in grades seven and eight in the Olathe District Schools. Since this study was focused only on 7th and 8th grade students, it might be difficult to generalize beyond that focus. This research represents one suburban school district's students and teachers. Therefore, it may also be difficult to apply the results either to other school districts or to demographically different areas.

Assumptions

The following assumptions regarding the effectiveness of interdisciplinary teaming and student achievement were made as part of the organization of this study. It was assumed that core staff members who served on an interdisciplinary team in grades

seven and eight had been trained and had participated in staff development opportunities explaining the district requirements and expectations for interdisciplinary teams and the characteristics of effective interdisciplinary teams. The district provided in-service training focused on middle-level students. At the building level, it was assumed that administrators provided time during pre-service training at the beginning of the school year for interdisciplinary teams to review district teaming documents and responsibilities, as well as to prepare for the year. This study was conducted with the assumption that teachers working on an interdisciplinary team worked to the best of their abilities to implement the characteristics and expectations of effective teams.

Two assessments were used in this study to collect student data, the Kansas State Reading Assessment and the Olathe District Schools' district reading assessment. It was assumed that each of these assessments was a reliable and valid measure of a student's academic reading performance. This assumption was based on the procedures used to construct a state assessment and the process used to align questions to state academic standards. The district assessment is a combination of released items from previously used versions of the state assessment and data analysis procedures to edit or add questions.

Research Questions

1. What is the relationship between the self-perceived effectiveness of an interdisciplinary teacher team and student academic achievement?
2. Does the percentage of Low SES students (those students receiving free and reduced price lunch) impact the relationship between the self-perceived

effectiveness of an interdisciplinary team of teachers and student academic achievement?

Definitions of Key Terms

Core Academic Subjects/Teachers: Core academic subjects consist of math, science, history, and language arts. Teachers of these subject areas are assigned a common group of students to form an interdisciplinary team (Arhar, 1992).

Interdisciplinary Teaming: For the purpose of this study, interdisciplinary teaming is defined as the core academic teachers working together in a team. The four teachers represent each of the core areas and educate a common group of students throughout the school day. Team members have a common planning time, which allows all team members an opportunity to plan, integrate disciplines, communicate, and collaborate with each other (Mertens & Flowers, 2004).

Young Adolescent: Students between the ages of 10 and 15, usually in grades five through nine (NMSA, 2002).

Common Planning Time: A designated planning period or time in the school day for team teachers to communicate and work together to improve their instruction and ability to meet the needs of their students. This common planning time is often in addition to personal teacher planning or preparation time (Arnold & Stevenson, 1998).

Middle School Concept: This philosophy is one in which schools are structured around a common group of team teachers educating a common group of students assigned to the teacher team. There is an emphasis on the social and emotional growth of students and a belief in community, not competition. Many characteristics (such

as interdisciplinary teaming, advisory period, counseling services, common planning time, and a focus on young adolescent students with regards to discipline, classroom management, and recognitions) of the middle school concept may or may not be a part of each individual school. Therefore, this study chose to focus on a small component of the concept, interdisciplinary teaming (Irvin, 1992).

No Child Left Behind (NCLB): National legislation devoted to educational equity and excellence for all, with a plan for student performance accountability. This law mandated assessment measures in all states to determine student performance and set standards for the proportion of students required to meet a minimum criterion. (National Education Association [NEA], 2009).

The Interdisciplinary Team Audit: The assessment tool used in this study to determine the level of effectiveness of each interdisciplinary team. The Audit was developed based on research of middle-level educational best practices and teacher input on the important characteristics of an effective teacher team. The construction and components of the Interdisciplinary Team Audit are further specified in chapter 3. A copy of the Audit can be found in Appendix A. (Presko,1998).

Kansas State Reading Assessment: This is an achievement test to measure student comprehension and application of state standards and indicators for reading. Students take the computerized, multiple choice format assessment in three testing sessions. Additional information is provided in later sections (Poggio, Irwin, Glasnapp, & Poggio, 2007).

District Reading Assessment: This is a mid-year achievement test to measure student comprehension and application of state reading standards and indicators. It is comprised of released items from the Kansas State Reading Assessments and is given in a multiple choice, paper/pencil format during three testing sessions. Additional information is provided in later sections (Olathe District Schools, 2010).

National Middle School Association (NMSA): An organization committed to the education of students in grades five through nine. This organization publishes a variety of resources for educators and holds conferences to build teacher knowledge and skills for working with young adolescent students. The NMSA is a leader in educational research on effective methods of educating young adolescents (NMSA, 2009).

Socio-Economic Status (SES): In this study Low SES is defined as a family's income meeting the federal income eligibility guidelines for receiving free or reduced price school lunches. The federal guideline is based on a family of four with an income of $40,793.00 a year or a weekly income of $785.00. Students from these families qualify for free or reduced price lunch at school and are additionally monitored for academic progress (Olathe District Schools [Free and Reduced], 2010; National Education Association [NEA], 2009).

Overview of Methodology

This research was designed to discover the strength and direction of the relationship between the self-perceived effectiveness of interdisciplinary teacher teams and student academic achievement. Interdisciplinary team effectiveness was measured

using the Interdisciplinary Team Audit, and student academic achievement was measured by the district and state reading assessments. The following sections of the overview of methodology provide additional information regarding the population represented in the study, how participants were selected, and the process used to collect and analyze data.

Population and Sample

The student population of interest in this study was young adolescent students, most commonly defined as children between the ages of 10 to 15, who participate in an interdisciplinary teaming organization most commonly found at grades 5-8. Seventh and eighth grade students in the Olathe District School were selected as the sample, subset representing the larger population of teamed young adolescent students. Teachers also play an important role in this study. The teachers selected for the study, as a sample of the larger population, focused their work with students in grades seven and eight and worked on one of 38 interdisciplinary teams of four teachers each (a total of 152 teachers) in the Olathe District School. These teachers also represented a variety of core curriculum content areas, years of experience, post- graduate educational levels, gender differences, and ethnicity.

Sampling

In this study, purposive sampling was used to select both student and teacher participants from the Olathe District School. Purposive sampling was chosen as the tool to ensure that selected participants fit a particular purpose and profile for the study (Straker, 2009). For students, the profile included that they attended an Olathe junior high school, were in grades seven or eight, and completed both the district and state reading assessments. The teacher profile for participation included that they were members of a

four person interdisciplinary team, completed the interdisciplinary team audit, and successfully coded student assessment information to include team identification. Because of absences, relocations, scheduling, or assessment coding, some students and teachers who met the criteria were not included in the study.

Instrumentation

Results from the district and state reading assessments were obtained directly from the district. The perceived effectiveness of interdisciplinary teams was measured by having each teacher on the team complete the Interdisciplinary Team Audit (copy located in Appendix A). Chapter Three provides additional information about the Interdisciplinary Team Audit and the district and state reading assessments.

Data Collection

Student assessment score data for this research study were obtained from the Director of School Improvement and Assessment for the Olathe District Schools. The Interdisciplinary Team Audit provided the teacher data collected for this study. This survey tool was given to the team teachers at all eight of the Olathe District junior high schools at the end of the third quarter of the 2006-2007 school year. The data were coded by building and team in order to protect teacher and team identity and to aid in the analysis.

Data Analysis

The Statistical Package for the Social Sciences (SPSS) software was used to determine descriptive characteristics such as mean, median, frequencies, standard deviation, and range. Analysis continued by calculating the correlation coefficients for Research Question One by investigating the relationship between the teachers' self-

perception of their effectiveness as a team and the students' assessment scores. Two more analyses of correlation coefficients were conducted for Research Question Two by investigating the relationship between the self-perceived effectiveness of the team as identified, first, with high percent of Low SES and, second, with low percent of Low SES students and student reading assessment scores.

Summary

Schools have embraced interdisciplinary teaming to address the academic, social, and emotional concerns of young adolescent students. However, with rising alarm over the academic performance of students at the middle-level grades and increased pressure to run financially efficient schools, interdisciplinary teaming is at risk of being eliminated to reduce educational costs. Arnold and Stevenson (1998) report that Interdisciplinary teaming "has enormous potential to meet the academic and social needs of young adolescents as well as to increase the effectiveness, enjoyment, and professional development of [team] teachers" (p.1). Additional data is needed to support the claims of the positive outcomes of interdisciplinary teaming on young adolescent academic development. As one avenue to demonstrate the relationship between interdisciplinary teams and student achievement, this study examined the self-perceived effectiveness level of 7th and 8th grade interdisciplinary teacher teams on student academic achievement, as measured by performance on district and state reading assessments. The following chapters provide additional information regarding interdisciplinary teams and this study. Chapter Two reviews background literature regarding interdisciplinary teaming and its impact on student achievement. Chapter Three describes the design and procedures used to complete the study. Chapter Four describes the results and data

analysis. Chapter Five summarizes results and discusses the implications of this study for middle school achievements and future research needs on middle-level concepts, including interdisciplinary teaming.

CHAPTER TWO

REVIEW OF LITERATURE

This review of literature consists of summarizations and reports from studies conducted about effective middle-level education and information regarding effective teacher teams. This chapter also includes information on successful interdisciplinary teams and various structures used in different studies, as well as a discussion of outcomes for student academic success while participating in the teaming concept. A portion of the review of the literature will be devoted to examining characteristics of effective teams as well as reviewing information on developmental characteristics of young adolescents and teaching/learning methods that enhance academic achievement. This chapter has been organized into the following sections; Academic Performance Concerns, Middle-Level Transitional Concerns, Adolescent Connectedness Concerns, Developmental Characteristics of Young Adolescent Students, Effective Interdisciplinary Teaming Components and Characteristics, chronological look at Highlights of Teaming and Middle-Level Research, and a Conclusion.

Academic Performance Concerns

Providing an academically excellent middle-level education for all young adolescents is the focus of school reform across the nation. Multiple sources, such as the National Educational Academic Performance assessment, the U.S. Department of Education and the Center for Collaborative Education report a decline in student academic performance at the middle-level grades and advocate for school reform initiatives. To support the need for middle-level reform, researchers use national data that report 40% of students completing grades six through eight perform below basic

levels in reading, math, and science (Southern Regional Education Board [SREB], 2001). The Southern Education Board (2001) reported data from The National Assessment of Educational Progress supported concerns about the academic performance of middle-school students, reporting that only 28% of eighth graders performed at the proficient level on the 2000 mathematics assessment.

Critics of the middle-school concept of interdisciplinary teaming state that middle-school students' academic performance has declined because of the middle-school focus on student non-academic or social growth, rather than being devoted to the intellectual development of young adolescents (Yecke, 2006). One critical report of middle-level education stated,

> The majority of the 14 million young adolescents (grades 5-8) enrolled in U.S. public schools continue to fare poorly on national and statewide performance assessments. One reason for this low level of achievement is impersonal schools where substantial numbers of students are not purposefully engaged in learning, lack meaningful relationships with adults, and are increasingly alienated from school (NMSA, 2004, p. 11).

Reports such as this propose that the reasons for declining performance are attributable to issues such as the lack of student engagement in effective learning experiences and the disappearance of positive teacher-student relationships. The growing concerns about academic performance of middle-level students and their lack of significant connections to teachers and the school community as a whole, point to reform methods which include the implementation of teaming to reorganize the social aspects of middle-level schools

and to enhance the overall academic experience for students (Arhar, 1992). As stated in chapter one, Mertens and Flowers (2004) suggest that teaming, through its personalization of learning, has the potential to positively impact the school culture and climate which will ultimately support learning and improved academic performance by young adolescent students.

Middle-level Transitional Concerns

In addition to academic performance concerns about middle-level students is the apprehension that students and parents report associated with the transition from elementary school to a middle school. Structurally, most middle schools house students in grades six through eight. Young adolescent students and their parents report transition to middle school is a time of increased educational change that brings with it a multitude of feelings and fears (NMSA, 2002). The move to middle-school is typically accompanied by the demand for students to take on increased responsibility for their own learning and behavior. Additional middle-school transitional fears involve the introduction of a new social dimension, new peer groups, and fitting in, along with the developmental processes of becoming an adolescent.

The social dimension of schools includes the structure and organization of a student's classes, movement throughout the day, peer contact, and teacher interactions. Another critical aspect of the social dimension of schools is transition, in which students physically move to a new location for the next grade level, which often causes a wide range of emotions for both students and parents. In particular, students must attend larger schools, interact with more peers, and meet the academic and behavior standards of seven different teachers throughout the school day (NMSA, 2002). Rising middle level

performance expectations result from increasing the number of teacher interactions and class movements during the day. As they move from class to class students become responsible for understanding and following classroom expectations, routines, and procedures for a variety of content-specific teachers.

As schools are faced with fast-paced societal changes, the consequences of adolescent development, student and parental transitional concerns, and a growing lack of public faith in the educational preparation of young adolescents, collaboration among teachers and grouping students into smaller teams (approximately 80-120 students per team) is one proposed logical solution (Irvin, 1992).

Adolescent Connectedness Concerns

Transition to a middle-school setting has the potential for creating a variety of concerns with the social and structural changes experienced by young adolescents. Additionally, social, economic, and technological advances bombard youths at incredible rates, and these changes add to the difficulty for youths to make solid connections in both their school and city communities (Arhar, 1992). Growing societal trends also reveal the collapse of traditional family structures and lack of critical adult, community, and school connections for many of today's youth (NMSA, 2004). By establishing a sense of community, the teaming of teachers in the educational setting provides students with a sense of belonging and connectedness, as well as bringing innovation to the learning experiences in the classroom (Merenbloom, 1996). As stated in Chapter One, above, Arnold and Stevenson (1998) added that teaming has the potential for meeting the social needs of young adolescents. The implementation of the team concept in the educational setting allows students to experience the benefits associated with a connected, small

community committed to common goals. Interdisciplinary teams afford students a group with which to associate, bond, and connect on all levels of learning, growing, and facing the future together.

In a research study, Boyer and Bishop (2004) found that this critical component of connectedness and identification in a teaming organization increased feelings of belonging and positive development for the young adolescent. The Boyer-Bishop research was designed to collect and evaluate adolescent students' opinions of effective interdisciplinary teaming: "Findings indicated that students felt like trusted members of a community, viewing themselves as self-disciplined and self-directed learners… growing in confidence, independence, and tolerance, gaining leadership and collaborative skills, and belonging to a family" (p. iv). The student voices from the Boyer and Bishop (2004) research study highlighted the essence of interdisciplinary teaming and the positive impact that implementing this collaborative organization can have on the emotional, physical, social, and intellectual development of young adolescent students.

The implementation of teams at the middle-school level assists students by helping them make connections with teachers and peers they see throughout common classes during their day. Ultimately, teaming promotes a small, community feel for the students (Arhar, 1992).

Developmental Characteristics of Young Adolescent Students

Middle-level teachers not only reflect on the previously mentioned areas of academic performance concerns of young adolescents, transitional concerns of students and parents, and lack of student connectedness to school and community, but middle-level teachers also have an understanding of the profound changes occurring in students

between the ages of 10 to 15. According to Sue Swaim, former Executive Director of the National Middle-school Association, young adolescence is a distinct period of human growth and development most commonly associated with 10-15 year-olds; and is a time of rapid and significant developmental changes (personal communication, April 13, 2007). Anfara, Mertens, & Caskey, (2007) mirror Swaim's explanation of the profound changes occurring in young adolescent development with the following clarification:

> The growth and development associated with the ages of 10-15 year olds are compared with that of the developmental ages of birth to 2. However, unlike the baby; the young adolescent is completely aware of the significant developmental changes occurring in their physical, emotional, and intellectual growth (p. 2).

In addition to understanding the characteristics of physical growth occurring in students, the middle-level teacher teams view young adolescents as "eager to learn, full of energy, ready for adventure, sociable, disarmingly honest, and ready to solve the problems of the world" (Center for Collaborative Education [CCE], 2003, p. 6). This critical developmental time of young adolescence is defined by the word "change." Students of this age group experience social, family, and school structure changes; personal belief changes; intellectual and physical changes; as well as emotional and moral changes (Anfara, Mertens, & Caskey, 2007). The knowledge and understanding of these profound changes experienced by young adolescents provides a platform from which the educational community can meet the developmental needs/changes of this age group.

Young adolescents need educational opportunities and settings that are organized to tackle their distinctive developmental characteristics. As middle-level schools work to be "developmentally appropriate" for young adolescents, they also strive to implement educational opportunities that are "academically excellent, developmentally responsive, and socially equitable" (S. Swaim [Former Executive Director of the National Middle School Association], Personal communication, April 13, 2007).

The National Middle-school Association (2002) stresses the importance of understanding the characteristics of young adolescent students and states that the middle-level educational system is set for failure if teacher teams are not aware of the characteristics of, and developmental changes occurring in, young adolescents. Failure is also reported likely if middle-level educators do not support the young adolescent students through appropriate and engaging curricula, structure, and organization (NMSA, 2002). Teaming at the middle level has been designed to specifically meet the social and academic needs of young adolescents (Arnold & Stevenson, 1998; Mertens & Flowers, 2004).

Overview of Effective Teams

In response to the call to meet the developmental needs of young adolescent students, successful middle-level educators have implemented interdisciplinary teaming to increase effectiveness of meeting the individual needs of students and supplying an environment devoted to student academic engagement and positive social connections. Teams have been linked to increased individualized educational opportunities for students, decreased isolation of students and teachers, and a foundation for building collaborative teaching practices that engage young adolescents in meaningful,

interconnected instructional activities (Kasak & Uskali, 2005). Teams are also linked to increased learning opportunities by actions that implement strategies such as creating and monitoring common goals, discussing and conferencing with individual students, providing an adult advocate for every student, and building on natural content/curriculum connections (DuFour, DuFour, Eaker, & Many; 2006). Erb and Stevenson (1999) established standards of managing effective interdisciplinary teams, which include the following:

1. Keep teams small in terms of number of teachers and students.
2. Provide sufficient individual and team planning time for teachers.
3. Allow teams to design their students' daily schedule.
4. Assign teams to their own area of the building.
5. Allow teams to work together for multiple years (p. 48).

Organizing a team is one step in the process of creating interdisciplinary teams that are effective and positively impact student growth and achievement. Erb and Stevenson (1999) also identified attributes of successful teams, which include:

1. Student-centered focus. Effective teams demonstrate attention to individual student successes, concerns, and opportunities for growth. Teams exhibit a student-centered focus by evaluating individual student work, monitoring student grades/attendance, and planning for instructional and team activities that meet the needs of students first. It is a "student first" mentality.
2. Strong commitment to academic achievement. Effective teams prioritize students' academic standings and skills. These teams also set goals for both the teacher team and students. In order to bring learning to life and increase

students' connection to academics, excellent teams find common instructional ground for linking learning in the classroom to subject areas, life-long skills, and the real world.

3. Collaborative policies and accountability systems. Effective teams develop management systems and classroom procedures/expectations that demonstrate consistency throughout the team teachers' classes. Students experience common practices and expectations during all of their team classes, facilitating a sense of understanding, community, and connections for the student.
4. Strong sense of team community. Teacher teams that function effectively have established a team community between teachers, students, parents, and other school personnel by implementing strategies that include teambuilding, class energizers, recognition programs, and development of common team norms that promote positive behavior and interaction between all members. Team instructional activities increase the effectiveness of climate-building activities and also involve a curriculum, content, or skill connection to building community.
5. Regular communication with parents. Teams that function effectively use communication with parents as a tool to build team community, a student-centered climate, and a focus on each individual's successes and needs. A common team planning period, in addition to personal teacher planning time, allows the teacher team to prioritize and successfully communicate with parents through electronic, phone, and/or newsletter resources.

6. A proactive approach (Erb & Stevenson, 1999, p. 48). Effective teams put words into action and make things happen that will enhance the learning environment and engagement of their students. According to Branham (1997), a proactive approach is described as thinking out of the box and, when others say it can't be done, making it happen through innovation, creativity, and persistence.

Teams that function effectively display a strong ability to work together and a commitment to common goals. Those common goals, which once were historically focused on what teachers would do in the classroom, are now centered on student involvement, improvement, learning, and social development. Highly effective teams develop goals that emphasize student learning (Rottier, 2001).

Effective teams also demonstrate an ability to collaborate with school and community professionals as well as parents and the students, themselves, to increase educational opportunities and solve problems as quickly and completely as possible (Clark & Clark, 1996). Collaboration is a key component in building relationships both with the educational community and with parents and students. According to Andrews, Caskey, and Anfara (2007), building positive relationships is a vital step in the process of increasing daily educational and instructional impact on student development and performance.

Common planning time affords middle-level teams the means to collaborate with others and engage in key discussions about student academic learning and social development (Williamson & Blackburn, 2006). To accomplish middle-level educational goals, teams use common planning time during each school day for designing flexible

scheduling with extended academic and creative learning periods. They also use this time for working together to plan for individualized learning opportunities in curricular areas, classroom instructional strategies, and formative and summative assessment practices (NMSA, 2004). Flowers et al. (1999) found that increased common planning time was one factor in increased middle-level student achievement on the Michigan Educational Assessment Program in the Michigan Middle Start Initiative.

As previously stated there are key components found in well-functioning teams. In these highly effective teams it is evident that they communicate clear expectations to the community and each other; have goals that are centered on students and their learning; and use common planning time for instructional planning, professional development and communicating with parents and students. The concept of interdisciplinary teams has a foundation in collaboration; therefore, the implementation of teaming at the middle level increases the effectiveness of middle-level teachers in solving problems, meeting student developmental needs, engaging students in meaningful curricular experiences, and building positive relationships and connections with students.

Highlights of Teaming and Middle-level Research

Highlighting research at the middle level required a focus on three essential middle-level reform initiatives. Established by the National Middle-school Association, Turning Points 2000, the National Education Forum, and reiterated by numerous researchers, the following three key middle-level concepts are needed to create schools that are:

1. Academically Excellent – schools are devoted to challenging all students intellectually through a variety of instructional, curricular, and assessment activities.
2. Developmentally Responsive – schools meet the development needs of young adolescent students by providing organizational structures devoted to helping build positive relationships and connections among peers, school, and teachers.
3. Socially Equitable – schools have high expectations for the performance and success of all students, not only currently, while in the school, but also as a focus on students' future potential in the workforce and global society (Andrews et al, 2007)

Historically, research at the middle level has focused on global implementation of these three concepts but has failed to produce results necessary to pinpoint student academic success to one particular practice as compared to other practices. Research targeted at the implementation of interdisciplinary teaming has followed the same path as other middle-level research and often has reported global results or overall impact to the middle-level program. Such studies have typically provided support for the social benefits of interdisciplinary teaming on young adolescent students but provided less support for the academic or achievement benefit (Arhar, 1992). The following chronological research reports address aspects of teaming which positively impact the education of young adolescents in a combination of academic, developmental, and social areas.

In a first of the chronological look at leading middle-level research, Arhar (1992) reported on 11 teamed and 11 non-teamed schools in an attempt to establish the scope to

which both demographic and organizational characteristics of the middle school and the demographic characteristics of middle-school students impacted student social bonding. The schools were matched in ethnicity, socio-economic status, geographical location, and whether they were part of a rural or urban school district. The sample included schools with enrollment from 230 - 1160 students. Administrators, teachers, and students participated in a survey of demographic and social bonding questions. Data from the study were analyzed using multivariate analysis of variance. The teacher bonding results ($F(1,143) = 13.88$, $p<.01$) showed that interdisciplinary teaming at the middle level allowed teachers to reach all students and provide opportunities for students to feel like valued members of a smaller community, therefore increasing their connections and reducing "student alienation" (Arhar & Krmrey, 1993, p. 144). The link between interdisciplinary teaming and improved student bonding was also demonstrated by the statistically significant results for student gender ($F(31395) = 2.83$, $p<.04$), student racial/ethnic group ($F(6,2790) = 3.83$, $p<.01$), and school organization ($F(31395) = 5.74$, $p<.01$) (Arhar & Krmrey, 1993). A connection can also be made with Boyer and Bishop's (2004) research of student perceptions about teaming, and confirmed from survey and student interviews, that students felt like self-directed, self-disciplined learners as well as valued members of the learning community. Teacher teams created a safe learning climate through instructional practices and focus on student learning. Differentiated instruction and an understanding of the needs of individual students became a focal point in schools where teaming was effectively implemented. One reason for this shift to spotlighting individual student needs was collaboration between team

teachers on global academic skills, rather than a narrow focus on independent subject matter concepts (Arhar, 1992).

In contrast to Arhar's focus on students' social bonding in creating an environment for learning, the second in the chronological look at middle level research is Newman and Wehlage's (1995) study that focused on the instructional ability of teachers to meet the academic needs of young adolescents. They conducted on-site observations of over 60 middle-level schools across the nation. The data were collected as they observed student engagement in hands-on learning experiences and interactions with teachers during the instructional period. Most notable were the findings that, when teachers thought of their role in educating young adolescents as one that reaches far beyond just classroom instruction, students developed stronger and more trusting relationships. Teachers who demonstrated the greatest connection to viewing their role beyond the classroom used hands on activities which incorporated real-world experiences, role-playing, and lessons which included the development of life and communication skills as students participated in planned instructional activities. Through the various activities implemented in the classroom, teachers were able to provide feedback to students about their learning as well as to probe for further connections to learning and life which resulted in increased positive student- educator relationships. Additional academic results data provided below also provides evidence of the connection between building community and improved academic performance of middle level students.

Newman and Wehlage (1995) divided the schools into three categories of performance, with low community, average community, and high community

representing the levels of collaboration, student-centered instruction, and ability to meet the needs of learners. Using scores from the National Assessment of Educational Progress, Newman and Wehlage reported that an average student from the low community group scored at the 36th percentile in contrast to the high community group, which demonstrated an average student score at the 67th percentile. Their study results highlighted the importance of collaboration among teachers at the middle level to meet the varied developmental and academic needs of students effectively. Williamson and Blackburn (2006) reported that common planning time provided the avenue for teams to collaborate on middle level practices, student performance, and ways to meet the needs represented by their students.

Merenbloom (1996), the third chronological look at middle level research, approached the reporting of middle-level practices in a different manner and provided an overview of best practices for middle schools to meet the academic and developmental needs of their students through the use of interdisciplinary teaming. While there is no supporting data in the report, the author based his recommendation on previously conducted research that focused on the work of interdisciplinary teams. Compiled from the work of others, Merenbloom provided an overview of the types of teams and the four domains of team processes. Three main types of teams were Interdisciplinary, Disciplinary, and Combination. Along with descriptions of each, Merenbloom included recommendations for the number of teachers per team and possible time schedules for classes and common planning time. The recommendation included teacher teams consisting of two to four teachers per team, with a maximum size of no more than a five-person team. Common planning time was emphasized as a daily part of the schedule

driven by an agenda collaboratively created by team teachers, administrators, counselors, and parents. A recommendation was made that teacher teams have classes in a block, which allowed for flexibility of instructional planning and for each teacher to have a student advisory class in which to further meet the social, emotional, and academic needs of students. The four domains included (a) responding to student need, (b) curriculum integration, (c) teaching strategies, and (d) flexible scheduling. These domains have become a foundation for the work of interdisciplinary teams and the impact teaming has on academic and developmental processes of young adolescent students. Rottier (2001) adds a recommendation in the book *Implementing and Improving Teaming, A Handbook for Middle Level Leaders*, regarding the practice of teaming core and encore (or elective) teachers together. While this can be difficult to manage in a master schedule the benefits of collaboration and focus on the school-wide experience for students is a valued outcome.

Fourth in the chronological focus on research is a study by Felner, Jackson, Kasak, Mulhall, Brand, and Flowers (1997). The study was conducted in 52 Illinois middle schools and regarded the execution of middle-level concepts and school improvement processes. The study included "25,000 students in 52 schools, whose enrollments ranged from fewer than 200 students to about 2,000" (Felner et al., 1997, p.529). The study included urban, rural, and suburban schools and represented a variety of cultural and socioeconomic blends. Felner et al. used suggestions from the *Turning Points: Preparing American Youth for the 21st Century* document, published in 1989, to create a survey and data collection process known as the Middle Grades Self-Study in order to compare results in three levels of implementation: high implementation, partial

implementation and no implementation. Felner et al. used confirmatory factor analysis to complete the ratings on the survey. The ratings of the items demonstrated moderate to high loadings with the target factors (CFI= .951; NFI = .950) on a ten point scale (Felner et al, 2003). In the second part of the study the results collected revealed a positive relationship between increasing levels of implementation and the academic success of students based on state standardized assessments. As schools increased their implementation of the Turning Points recommendations, the one-year correlation results for the reading score was .51 ($p < .001$) and the math score was .30 ($p < .001$) (Felner et. al, 1997) Results also confirmed that schools that used an all-inclusive and detailed approach to school improvement and achievement of the Turning Points initiatives reported a decreased number of discipline reports in comparison to schools that did not apply an all-inclusive improvement plan founded on the Turning Points suggestions.

Also included in the chronological highlights of middle level research is Lipsitz, Jackson, and Austin's (1997) study that reported on four middle-level research and reform initiatives. The Middle Grades Self-Study data collection process, created and conducted in Felner et al.'s (1997) research was also utilized as the technique of data gathering in these four middle-level reform projects: (a) the Middle-level Grades Network, from the Association of Illinois Middle-level schools; (b) the Middle Grades Improvement Program in Indiana, maintained by Lilly Endowment Inc.; (c) the Middle Grades School State Policy Initiative, a nationwide program sustained by the Carnegie Corporation of New York; and (d) the Middle Start initiative in Michigan, maintained by the W.K. Kellogg Foundation. The four initiatives included 420 schools, 14,000 educators and principals, and 158,000 students. The four initiatives administered the

Middle Grades Self-Study to collect data regarding the implementation of middle-level concepts and practices. Lipsitz, Jackson, and Austin evaluated the relationship between various components of middle-level reform efforts and student performance outcomes. In the states of Indiana and Michigan, the data collected were used to further middle-level reform initiatives by including recommendations and best practices. Additional information is provided regarding the individual outcomes for the Indiana and Michigan studies.

The Indiana project (1997), funded by the Lilly Endowment's Middle Grades Improvement Program, focused on middle-level education and the development of young adolescents. The participating schools created, and then implemented, a strategic plan to improve the educational development of middle-level students. Those schools that focused on instruction and connecting schools to parents demonstrated academic success. Results showed that implementation of individual components of reform initiative resulted in little or no significant change in student academic performance and positive social development. However, it was reported that, with multiple pieces of reform initiatives in place and implemented effectively, significant academic and positive growth occurred in students as demonstrated on the Middle Grades Self-Study data collection tool (Lipsitz et al, 1997). These large, well-organized research studies have started to offer solid support that middle-level reform efforts and interdisciplinary teaming positively affect students' educational experiences and improve students' attitudes about school, however, additional documentation is needed to solidify the impact of interdisciplinary teaming on student academic achievement.

In the Michigan study (1999), teaming positively impacted both students and teachers, as evidenced by "the data collected from a group of 155 middle-schools in Michigan that were part of the Middle Start Initiative funded by the W.K. Kellogg Foundation" (Flowers et al., 1999, p. 37). Five outcomes from the Michigan Middle Start Initiative were noted as significant to the increased benefit of teaming on student achievement and teacher performance. The five outcomes are discussed in further detail next.

Flowers et al. (1999) reported that common planning time was the first outcome that made a difference in the education of middle-level students, according to the results of the study. Using a structured common planning time increased teachers' abilities to know the students and meet their educational needs. Team teachers also had time to plan team activities, discuss instructional methods, and problem solve with students about academics, behavior, and social concerns. The Michigan Middle Start Initiative linked schools, with increased common planning time and smaller team student-teacher ratios, to larger gains in student achievement scores than schools with less or no common planning time and larger team student- teacher ratios. In schools with full implementation, the average gain in math/reading achievement scores was 21 points. This is compared to intermediate levels of implementation, average levels of implementation and little or no implementation, for which the average gains in achievement scores, respectively, were 12 points, 3 points and negative gains (Felner et al., 1997). The study showed that middle-level schools with teacher-led advisory programs, in which preparation for the advisory time occurred during team common

planning time, also revealed a boost in student assessment scores as compared to those schools with no advisory programs.

The second outcome from the Michigan Middle Start Initiative was that teaming improves the work climate. Teachers from middle-level schools that implemented teaming reported greater satisfaction in areas of school climate, including staff acknowledgment, staff loyalty, and clearness of responsibilities, than did teachers from non-teaming schools.

The third outcome from the Michigan study was that teaming increases parental contact. Increased parent contact was reported by 101 middle-level-school teacher teams in the areas of educational performance reports and problems, promotion of parent involvement in school and team activities, and providing information regarding developmental needs in all areas of adolescent development. Although results demonstrated a need to increase the frequency and content of parent communication, teaming schools more frequently reached out to parents and community than did non-teaming schools.

The fourth outcome identified was that teaming increased job satisfaction. Teaming teachers reported greater job satisfaction and highlighted collaboration with colleagues, increased opportunities for leadership roles on the team and in the school, and an increased sense of control over scheduling, instructional decisions, and student management. Although not directly linked to student achievement, an increased sense of empowerment on the part of teachers could, nonetheless, ultimately result in an increased impact on student performance. The Michigan Middle Start Initiative study also reported

that schools with a longer implementation history of teaming demonstrated greater teacher job satisfaction.

The fifth outcome of the study found that teaming was associated with higher student achievement. The assessment data collected for this investigation were found in the student Michigan Educational Assessment Program (MEAP) for reading and math which is given annually to 7th grade students in Michigan. Schools that used interdisciplinary teaming demonstrated higher achievement than schools that did not use interdisciplinary teaming. In the 1996-97 school year, teaming schools had an average of 38.5% of students scoring "proficient," on the reading portion of the MEAP while non-teaming schools scored 33% "proficient." Similar results were reported on the math section of the MEAP; teaming schools had an average of 48.5% of students scoring "proficient," while non-teaming schools scored an average of 44% "proficient." Results of the MEAP were also reviewed for the 1994-95 and 1996-97 school years to identify growth over time in student performance. Schools with the largest amount of common planning time for team teachers demonstrated an increase of 8% in performance on the reading section and a 6% increase on the math section of the MEAP. From 1994/95 to 1996/97 students in schools where teams had less common planning time recorded a 3% gain in reading and a 5% gain in math between the two school years (Flowers et al., 1999).

The Indiana and Michigan studies provided further connections to the original work of Felner et al. (1997) with the implementation of the assessment tool and reporting findings to verify that middle level reform initiatives, when implemented completely and effectively, contribute to the overall success of middle level students. The positive

contribution of these studies began to lay the foundation for middle level practices that are linked to academic achievement and improvement in student performance. One important foundation was that of interdisciplinary teaming as one avenue for making a difference for middle level students.

Next in the chronological search is a study conducted by Flowers et al as a follow-up to the Michigan Middle Start Initiative, data from the 1998-1999 school year on 70 middle-grade schools demonstrated a link between aspects of interdisciplinary teaming and classroom practices related to student achievement. Although previous research had touched on the link between implementing teaming and improved student academic learning, the data collected in a follow-up study to the Michigan Middle Start Initiative demonstrated further positive connections between effective implementation of teaming and student learning in the classroom (Flowers et al., 1999). The correlation between increased levels of implementation and student achievement gains in the first study were .51 ($p < .001$) for reading and .30 ($p<.001$) for math. In the follow-up studies, the correlations show a similar pattern of .53 ($p<.001$) for reading and .35 ($p<.001$) for math (Felner et al., 1997). Studies such as the Michigan Middle Start Initiative began to solidify the connection between interdisciplinary teaming and student achievement. As stated by one middle school principal of a middle start study school, "Teachers are better prepared, have better lesson plans, and are more focused on students. Students became more engaged in their classes as more teachers began to use cooperative and project-based learning and portfolio assessments" (Middle Start, 2007, p. 5). In the previous research summaries, data and outcomes assist in identifying additional important

components that impact the education of young adolescent students and the implementation of teaming in middle-level educational settings.

Wallace (2007) added to the body of interdisciplinary teaming research by conducting an investigation into the impact of teacher team organization on student's social connection to classmates, the school, and teachers. For the study, 10 schools of similar size, ethnicity, and socioeconomic status were identified. Five of those schools had teams of 100 students taught by four teachers, with each teacher assigned a specific content area. The other five schools were configured with two-teacher teams teaching multiple subject areas to 50 students (Wallace, 2007). The matched-pairs design allowed the research to account for variables and to determine, from the survey results, the correlation of social bonding to teacher-team configuration. Students' survey results highlighted a greater correlation to positive student social bonding with peers, school, and teacher on the team configuration with two teachers teaching multiple subjects to 50 students. Further information and data regarding student academic achievement were not collected in the Wallace study but, as with all the chronological research presented, positive student outcomes are reported when schools use interdisciplinary teaming and/or implement the components of effective middle-level reform initiatives.

In response to middle-level research and the data collected, leading middle-level organizations made the following recommendations to support the characteristics of young adolescent development and the components of effective middle-level education. The National Middle-School Association and The National Association of Elementary Principals combined to propose a call to action, published in March 2002 that advised middle-level schools to incorporate organizational structures which provide students with

constructive adult connections and support during the school day (NMSA, 2002). It was noted in both the Michigan Middle Start research results and in the National Middle-School Association research brief that building positive relationships with students was a critical component of effective teaming practices and, therefore, important to middle-level education (Flowers et al., 1999; NMSA, 2004).

The National Forum to Accelerate Middle Grades Reform advised policymakers to supply necessary financial support and encouragement to construct small schools at the middle level. In the cases where creating small schools was not possible, the National Forum recommended that educational leaders split big schools into smaller learning communities. "*Smallness,"* as it was coined, provided students with the personalized attention and connections necessary to enhance learning at the middle level (NMSA, 2004). The idea of smaller teams/schools was originally supported by Arhar's (1992) research findings that smaller communities reduce alienation and support the social growth of students. Merenbloom (1996), as previously reported, also noted the recommendations for interdisciplinary teams to support between 80 and 100 students as the most effective use of resources and expectation of improved student performance and connections.

Impacting young-adolescent development and academic achievement have been foci for many researchers and reformists of middle-level education. Research on interdisciplinary teaming supported the positive attributes of teaming and the effects of this organizational structure on student achievement and development. Additional research is needed to provide a strong connection between student academic achievement and the implementation of interdisciplinary teaming.

Conclusion

As schools look toward an unknown future that is constantly changing, with high-stakes testing, lack of public confidence, social upheaval, and lack of funding, many school districts are faced by questions related to what best practices are truly making a difference at the classroom level for all students. As these and many more questions are raised, school boards, district personnel, and parents must weigh the consequences of implementing a quality program with short and long-term financial costs (Flowers et al., 1999). The majority of the research reviewed has established a foundation for the social, emotional, transitional, and relationship advantages associated with implementing teaming at the middle-level. Middle-level research has started to collect promising data on student achievement when schools effectively implement interdisciplinary teaming and other effective components of middle-level reform initiatives. Understanding that it is what happens at the classroom level that is most important to increasing student learning brings an added dimension for researchers to contend with as studies are conducted (Flowers et al., 2000). Teachers have the most effect on student achievement; therefore, an organizational method that supports building relationships, teacher collaboration, and curriculum integration should have a great deal of influence on student learning. As with all programs implemented with the hope of increasing student academic achievement, communication between all parties is key to making effective decisions at all levels and impacting the classroom learning environment (Flowers et al., 2000). Communication is the critical link between middle-level researchers, educators, community members, parents, students, and local education board members as data are collected, shared and support developed for teaming at the middle-level. The devotion to

communication provides the foundation for middle-school best practices because individuals outside of the school have a more difficult time seeing the positive impact of teaming on students when some of those benefits are not easily displayed as measurable outcomes (Flowers et al., 1999).

CHAPTER THREE

METHODS

This chapter highlights the research methodology and procedures used in the study. The purpose of the study, research design, population of the study, instrument development and implementation, methods and procedures for data analysis, and limitations of the study are included in this chapter to provide further details about the methods used to complete the study.

Purpose of the Study

The purpose of this study was to identify the relationship between the self-perceived effectiveness of interdisciplinary teacher teams and 7th and 8th grade student academic performance as measured by the Olathe school district and the Kansas state reading assessments. Therefore, the investigator hypothesized that, the more an interdisciplinary team perceives themselves to be meeting the characteristics of effective interdisciplinary teams, the better their students' would perform on the district and state reading assessments.

Research Questions

1. What is the relationship between self-perceived effectiveness of an interdisciplinary team and student academic achievement?
2. Does the percentage of students receiving free and reduced price lunch status impact the relationship between the self-perceived effectiveness of an interdisciplinary team of teachers and student academic achievement?

Research Design

The overall design of this study was a quantitative research approach. Quantitative studies are further categorized into methodologies in order to meet the goals of the research (Straker, 2009). In this study, a correlational research methodology was used to identify the relationship between the self-perceived effectiveness of an interdisciplinary teacher team and the students' academic performance as measured by district and state reading assessment scores.

Sample

The student sample for this study consisted of 3,672 7th and 8th grade students from eight junior high schools in the Olathe School District. The student demographics at each of the junior high schools are described below (Olathe District Schools, 2009):

School 1

1. Five hundred and sixty students compose six interdisciplinary teams
2. Female: 49.4%; Male: 50.6%
3. Students meeting requirements for Free or Reduced Lunch (Low SES): 3.7%
4. Ethnicity: White: 88.57%; African-American: 3.93%; Hispanic: 1.67%; Other: 5.83%

School 2

1. Five hundred and fourteen students compose six interdisciplinary teams
2. Female: 52.01%; Male: 47.99%
3. Students meeting requirements for Free or Reduced Lunch (Low SES): 7.0%
4. Ethnicity: White: 85.86%; African-American: 4.93%; Hispanic: 4.41%; Other: 4.80%

School 3

1. Four hundred and seventy students compose four interdisciplinary teams
2. Female: 51.35%; Male: 48.65%
3. Students meeting requirements for Free or Reduced Lunch (Low SES): 7.66%
4. Ethnicity: White: 87.52%; African-American: 4.68%; Hispanic: 2.70%; Other: 5.11%

School 4

1. Three hundred and twenty-six students compose four interdisciplinary teams
2. Female: 50.72%; Male: 49.28%
3. Students meeting requirements for Free or Reduced Lunch (Low SES): 33.13%
4. Ethnicity: White: 67.69%; African-American: 9.82%; Hispanic: 18.40%; Other: 4.09%

School 5

1. Four hundred and six students compose four interdisciplinary teams
2. Female: 49.26%; Male: 50.74%
3. Students meeting requirements for Free or Reduced Lunch (Low SES): 31.20%
4. Ethnicity: White: 67.65%; African-American: 7.06%; Hispanic: 21.02%; Other: 4.27%

School 6

1. Four hundred and sixty-two students compose five interdisciplinary teams
2. Female: 45.24%; Male: 54.76%
3. Students meeting requirements for Free or Reduced Lunch (Low SES): 22.33%

4. Ethnicity: White: 74.5%; African-American: 11.82%; Hispanic: 6.77%; Other: 6.92%

School 7

1. Five hundred and thirty-three students compose six interdisciplinary teams
2. Female: 47.38%; Male: 52.63%
3. Students meeting requirements for Free or Reduced Lunch (Low SES): 11.50%
4. Ethnicity: White: 84.63%; African-American: 4.75%; Hispanic: 5.0%; Other: 5.63%

School 8

1. Four hundred and one students compose four interdisciplinary teams
2. Female: 49.08%; Male: 50.92%
3. Students meeting requirements for Free or Reduced Lunch (Low SES): 36.27%
4. Ethnicity: White: 64.56%; African-American: 11.98%; Hispanic: 16.14%; Other: 7.32%

Figure 5, below, depicts each school's percentage of the total student enrollment in junior high schools. School 1 has the largest enrollment, while School 4 has the smallest enrollment.

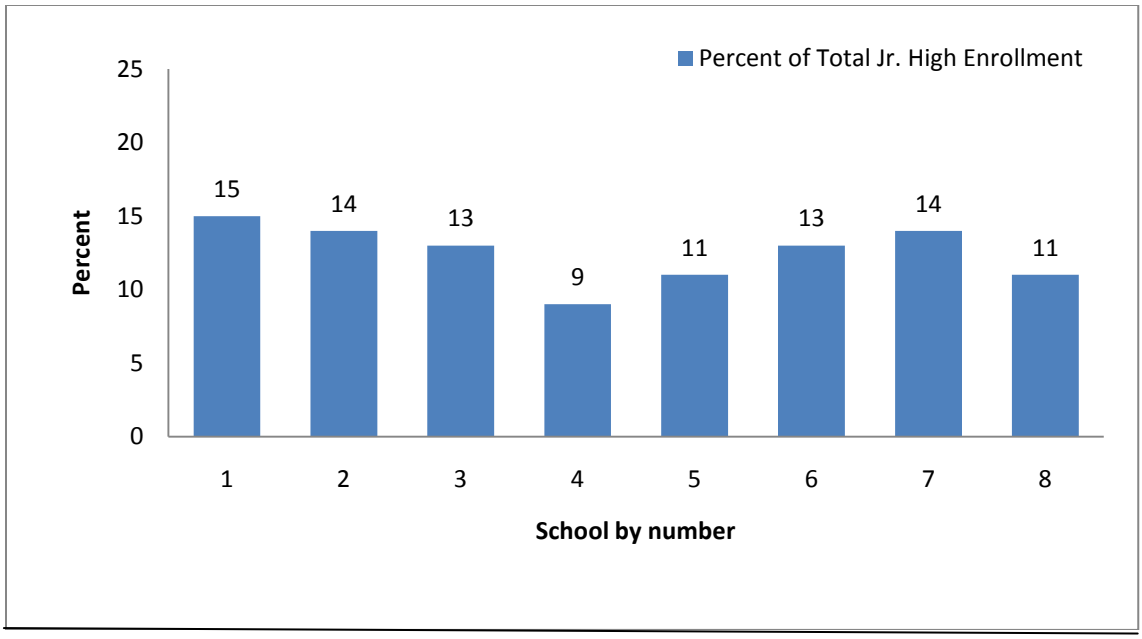

Figure 5. Enrollment by School. Each bar represents the percentage of total junior high school enrollment that the school comprises.

Olathe District Schools, 2010 Enrollment Statistics ; KSDE, 2010; From personal communication by A. Banikowski, September 10, 2007.

The variations in the percentages of students representing the low SES student group at the junior high schools in the Olathe District Schools are noted in Figure 6, below. Each bar of Figure 6 shows the identified school's Low SES population as a percentage of the total district junior high Low SES population. School 8 has the largest percentage of the district's identified Low SES students, while School 1 reports the smallest percentage of Low SES students.

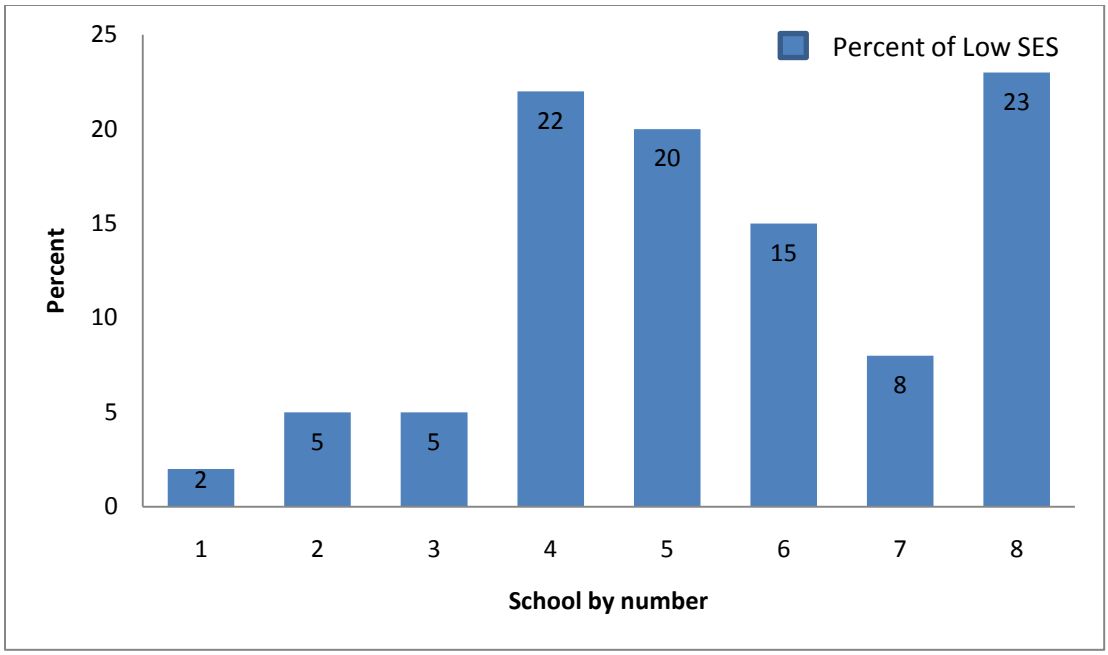

Figure 6. Percentage of Total Low SES District Distribution Enrollment at Each School. The percentage for the school that comprises a part of the total junior high district Low SES population.

Olathe District Schools, 2010 Enrollment Statistics; KSDE, 2010; From personal communication by A. Banikowski,, September 10, 2007.

The second sample was the 152, 7th and 8th grade interdisciplinary team teachers. In this study, the interdisciplinary teams were comprised of one teacher from each of the four core subject areas: history, math, science, and language arts. Table 1, below, provides demographic information regarding the teachers involved in this study.

Table 1

Demographic Data of Team Teachers

Category	Data Collected
Percent of Female team teachers	66
Percent of Male team teachers	34
Percent of team teachers with a Master's degree or higher	60
Percent of team teachers with white ethnicity	89
Percent of team teachers with African American ethnicity	6
Percent of team teachers with other ethnicity	5

Instrumentation Used for Students

Students' district and state reading assessments provided the instrumentation tool for this research. The district assessment was administered in December to all 7th and 8th grade students using a paper/pencil format test with a district Scantron answer sheet. This assessment was created by aligning released test items from the state reading assessment to curriculum and state reading indicators in order to provide information to teachers regarding student performance reading indicators. The assessment was given over a period of three class sessions and Scantron sheets returned to the district's assessment department for review and grading. Results for individual students, as an overall percent correct, were recorded and organized in a spreadsheet for this research.

The Kansas State Reading assessment, used to measure students' overall understanding and application of the state reading indicators, was given to students in the 7th and 8th grades during the month of March. The Kansas reading assessment was

administered electronically. Students in the 7th and 8th grades were given three class periods to complete the assessment in reading. These were not timed tests, so additional time was allotted as needed for individual students. The State Department of Education provided procedures for administering the Kansas assessments in a variety of communication links and materials. The Assessment and School Improvement office of the Olathe District Schools provided additional assessment procedures and expectations. This communication highlights procedures for read aloud accommodations, timing guidelines, and specifies resources students may use during the test. Information from the state and the moral and ethical expectations for administering the state assessments are also included in the district communication materials. For the purpose of this study, the overall percent correct for each student was organized and recorded on a spreadsheet to allow for further hypothesis testing.

Validity and Reliability of Students' State and District Assessments

Student data were collected from district and state reading assessments that provided reliable information on student reading academic achievement as an overall percent correct. District test items consisted of released problems aligned to the state indicators. The assessments were given to all 7th and 8th graders following state and school district guidelines and timeframe. The Kansas State reading assessment was constructed by WestEd, a leading assessment developing company. Test questions were created based on state reading standards and were field-tested using three to five test forms over two empirical pilot testing sessions. After administering the pilot test, statistical item analyses were performed to establish the effectiveness and value of the questions. Traditional or classical-item analysis was the technique employed to assess

the question data. Data collected and analyzed provided the state with the items needed for inclusion on the final testing forms which showed evidence of student learning and understanding (Poggio, Yang, Irwin, Glasnapp, & Poggio, 2007).

Instrumentation Used for Teachers

The Interdisciplinary Team Audit (found in Appendix A), developed by Presko (1998), was the tool used to measure team effectiveness for this study of 7th and 8th grade teacher teams in the Olathe District Schools and was distributed to 152 teachers. Permission (located in Appendix B) to use the Interdisciplinary Audit was granted from Kimberly Presko. The Interdisciplinary Team Audit was developed for the purpose of creating a "reliable and valid instrument to assess the effectiveness of interdisciplinary teams" (p. 3). The Audit was developed from the following:

1. a review of the literature and research
2. perceptions of practitioners of interdisciplinary teaming
3. field-testing and refinement through statistical analysis (Presko, 1998)

After the review of the literature and research, the initial instrument was constructed with 77 items derived from the following 10 constructs: (a) interpersonal communication, (b) parent/community communication, (c) empowerment, (d) team leadership, (e) common planning time, (f) classroom proximity, (g) scheduling, (h) curriculum, (i) management of student behavior, and (j) team activities (Presko, 1998). Presko's initial instrument was distributed to 100 randomly selected interdisciplinary team teachers in Missouri middle schools. Selected teachers had to have participated in a teaming organization for two or more years in order to be considered for participation. Each teacher responded to the 77 items using a nine-point Likert Scale (a rating of one on

the scale is “not important;” a rating of nine is “extremely important”) to report the importance of each concept to the overall functioning of the interdisciplinary team. Presko (1998) designed two final forms of the Interdisciplinary Team Audit reduced from the 77 to 30 items as well as a reduction from 10 constructs to 4. One form contains the 30 items organized into the four constructs, while the second form has the 30 items randomly arranged for participants to select the corresponding level of effectiveness. The second form, consisting of the randomly placed items, was used as the data-collection tool for the teachers in this study.

The final form of The Interdisciplinary Team Audit uses a nine-point Likert scale for participants to rate their perception of the team’s effectiveness on the implementation of each statement about team function, structure, or performance. The Likert scale on the audit consists of the following breakdown, “a rating of one on the scale would correspond to ‘not effective,’ a rating of five corresponds to ‘moderately effective,’ while a rating of nine corresponds to ‘extremely effective’” (Presko, 1998, p. 24). A copy of the Interdisciplinary Team Audit can be found in Appendix A.

Validity of the Interdisciplinary Team Audit

The Interdisciplinary Team Audit was found to be a valid and reliable tool with which to measure an interdisciplinary team’s effectiveness. The original tool was field tested with middle-level teacher interdisciplinary teams and the data analyzed to provide support for the instrument. The data were then analyzed using a varimax orthogonal factor analysis. Factor analysis allows a researcher to develop a scale on which to rate or compare groups, things, or actions. It reveals patterns of interrelation among variables. A significant factor-loading is greater than .3 for a large sample size (Sheskin, 2007). In

terms of this study patterns are the four constructs. Using the outcome of the factor analysis, Presko (1998) created a revised instrument with 30 items, each under one of four main categories of:

1. Instructional Practices: 12 items comprise the instructional practices construct and measure the degree to which team teachers use effective instructional strategies and integrate curriculum and assessment into classes;
2. Student Orientation: 10 items make up the student orientation construct and assess team teachers in the ability to promote students' intellectual and social development;
3. Team Organization: four items in this construct help to measure the degree to which the team conducts team responsibilities; and
4. Team Structure: the remaining four items assess the team on its ability to facilitate team processes and plan together (pp. iii-iv).

Tables 2-5, below, represent the final factor loading values for the constructs of the Interdisciplinary Team Audit's items. Table 2 looks at the instructional practices construct.

Table 2

Factor Loading for the Instructional Practices Construct

Item #	Item	Factor Loading
18	Team members integrate curriculum.	.60
31	Team members use evaluative data from students to assess their programs and practices.	.61
32	Team members use parents/community members as volunteers in their classrooms to help with special events and activities.	.56
37	Team members provide exploratory experiences for students.	.59
38	Team members collaborate to eliminate curricular objective duplication.	.58
40	Team members use team building activities to create a sense of identity and community among teams of students.	.59
42	Team members provide information to the community about middle school programs.	.58
47	Team members use small and large groupings when delivering instruction.	.59
50	Team members use activities to promote tolerance and appreciation for cultural diversity.	.58
54	Team members use flexible scheduling to provide needed time for various classroom activities.	.55
55	Team members integrate curricular activities to aid in providing modifications for students with I.E.P.s.	.57
77	Team members utilize interdisciplinary focus which helps apply knowledge and skills across disciplines.	.61

The above items in the instructional practices construct all demonstrated factor values above .30 and were, therefore, included in the final Audit version as having a strong correlation to the instructional practices of effective teams.

Table 3

Factor Loading for the Student Orientation Construct

Item #	Item	Factor Loading
28	Team members stress basic skills across each content area.	.47
51	Team members show respect towards teachers and students with whom they work.	.51
58	Team members show concern for students as well as subject matter.	.73
62	Team members use activities/lessons which require problem-solving skills and creativity.	.64
63	Team members provide a safe classroom environment for students.	.75
66	Team members use common planning time to identify and diagnose student needs.	.51
69	Team members show compassion, flexibility, and tolerance when working with students.	.64
71	Team members provide students with curriculum that focuses on the acquisition of knowledge, skills, and personal development.	.72
72	Team members provide students with opportunities to demonstrate responsibility.	.73
74	Team members utilize personnel such as counselors, specialists etc. during common planning time to meet the students' needs.	.47

The student orientation construct also demonstrated high factor-loading scores to merit inclusion in the final survey product. Reporting scores well above .30, the statements were included as characteristics of effectiveness of interdisciplinary teams in practices under student orientation.

Table 4

Factor Loading for the Team Organization Construct

Item #	Item	Factor Loading
14	Team leaders keep team members on task during team meetings.	.79
15	Team members record minutes and decisions made during team meetings.	.62
24	Team leaders use meetings with the administration to discuss team concerns and issues.	.61
44	Team leaders coordinate team activities as a responsibility of their job.	.65

The above items under the team organization construct scored well above the .30 factor loading for inclusion in the final team audit survey. Of the field-tested items, these four demonstrated a correlation to effectiveness of the organizational construct of an interdisciplinary team.

Table 5

Factor Loading for the Team Structures Construct

Item #	Item	Factor Loading
5	Team members are provided with common planning time during the school day.	.55
6	Team members' classrooms are located in the same area of the building.	.74
16	Team members' classrooms are adjacent to one another.	.72
43	Team members share the same group of students.	.50

Factor-loading values for the team structures construct also demonstrated correlations above .30 and, therefore, were included in the final audit survey.

In summary, the Interdisciplinary Team Audit was found to be a reliable and valid instrument for identifying the effectiveness of an interdisciplinary team of teachers at

meeting the needs of young adolescent students in the four identified constructs of instructional practices, student orientation, team organization, and team structures.

Data Collection Procedures

Permission for research was requested and granted by both the Olathe District Schools and Baker University. Appendices C and D include copies of the approval forms for this step in the research-project process.

Information and a request for permission were sent to building administrators at the eight junior high schools. The same notice and information was sent to team teachers following approval by the building administrators. This brief information included an explanation of the purpose of the study and the process to be used during the 15 to 20 minute portion of the team planning time. These communication pieces are included in Appendices E and F. Teams were asked to communicate with the Instructional Resource Teacher (IRT) or the researcher if they had additional questions or scheduling conflicts.

Data collection procedures for the students' district assessment scores required completing a request for data from the Olathe District Schools Assessment and School Improvement Office. As stated in an earlier section of this chapter, students completed the paper/pencil assessment in mid-December and results were distributed in an Excel spreadsheet.

Seventh- and eighth-grade student data collection also included results from the Kansas Reading Assessment. The Kansas State Department of Education maintained these scores and distributed them to the local school district following final review. For this research study, the Olathe District Schools Assessment and School Improvement office provided student data with the percent correct in an Excel spreadsheet. Student

scores were analyzed and linked with the scores of 7th and 8th grade team teachers' Interdisciplinary Team Audit results to determine if a relationship existed among the data.

Following the selection of The Interdisciplinary Team Audit as the instrument of use for the study, a training meeting was conducted for the volunteer distributors of the Audit. Olathe District Schools Instructional Resource Teachers (IRTs) were trained, and then assisted, with this process by attending interdisciplinary teacher team planning times to distribute and collect the Audit. IRTs were assigned to various buildings across the district and offered to help with this step in the study. In order to reduce teacher stress and to support anonymous responses from the participants, IRTs attended team meetings they only at buildings to which they were not regularly assigned. The training meeting consisted of information about the purpose of the study, reasons for the selection process, an explanation of confidentiality procedures (which included a blind team numbering system from the IRTs and survey's were completed with no names), and a review of the Interdisciplinary Team Audit. IRT's discussed the procedure for completing the Audit and storing the completed Audits to ensure confidentiality. They then answered any questions team teachers asked regarding the research process. The IRTs attended the team meetings to: (a) provide explanation in person of the purpose of the study and the process to be followed, (b) distribute the Audit to each team, (c) to answer questions for standardization purposes and, (d) to collect and return Audits for data analysis.

Data Analysis

The data were entered in the SPSS software to determine descriptive characteristics such as mean, median, range, frequency, standard deviation, and minimum and maximum scores. Descriptive statistics provided an overview of the data collected.

To address the first research question, the mean score from the Interdisciplinary Audit of team teachers' perceptions of effectiveness was calculated by finding the average score of each teacher's responses and collectively finding the mean for each respective team. Student assessment scores were recorded for both the district and state reading assessments and organized by interdisciplinary team. The teacher team mean was repeated for each of the individual student scores as part of the SPSS spreadsheet organization. It was determined that Pearson's correlation coefficient was the best index to demonstrate a relationship between the interdisciplinary team teacher results and the student assessment results. Pearson's correlation was calculated using SPSS software to determine if a relationship existed between the teacher teams' mean score from the Interdisciplinary Audit and student assessment scores. Significance was set at the .05 level. The independent variable was the self-perceived effectiveness of the team while the dependent variable was the performance of the team's students on the District and Kansas Reading Assessments. It was hypothesized that the more a team perceives itself to be effective, the higher the students' scores are on the reading assessments.

The second research question was also investigated using Pearson's coefficients, but was organized in a slightly different manner. The interdisciplinary teams were divided into two groups, high percent of Low SES and low percent of Low SES. The division was completed using a median split with the three schools of highest percent of

Low SES making up one group and the three schools with the lowest percent of Low SES in the second group. The school falling in the middle had scores reported from two teams and therefore one team was placed in each of the groups comprising the median split data organization. The data organization within each of the groups remained the same concerning the team teacher score and the student assessment scores. The coefficient for the group of low SES teams was calculated to show the relationship between the self perceived interdisciplinary team effectiveness and student academic achievement. The same coefficient was found for the group of high SES teams and then the two sets of data results were compared.

An additional area of interest was investigated following the first hypothesis test. This investigation focused on a single construct area on the Interdisciplinary Team Audit having to do with instructional practices. The review of literature (see, for example, Arhar, 1992 and Boyer & Bishop, 2004, as reported in Chapter Two) examined studies which suggest the positive impact interdisciplinary teaming has on students' social, emotional, and affective development versus the impact of interdisciplinary teaming on academic achievement. Additional analyses were conducted to address the impact of daily instruction students receive from interdisciplinary team teachers and the connection to student academic achievement and performance. The additional analysis provided the foundation for further investigation of the team teachers' perception of their effectiveness in the instructional practices construct on the Interdisciplinary Team Audit. The team's mean score was calculated using only the instructional practices construct questions for each interdisciplinary teacher team. This score was then entered and correlated with

student assessment scores. Chapter Four describes in greater detail the statistical analysis and findings of this clinical research study.

Limitations of the Study

The particular method of teaming used in these junior high schools, along with different class time schedules; represent limitations in making recommendations on a larger scale for application of the results to other schools and school districts. Further research is needed to investigate long-term effective teaming and the implications of teaming on student achievement.

Summary

This clinical research study was organized as a quantitative study and included the use of a correlational research design. The focus was on the relationship between the self-reported effectiveness of an interdisciplinary team and student academic achievement. The sample was 7th and 8th grade students and teachers working with those grades who participate in collaboration through the interdisciplinary teaming structure. Teachers completed the Interdisciplinary Team Audit to assess their effectiveness as an interdisciplinary teacher team and students completed the district and state reading assessments to assess student academic achievement. The data were organized and analyzed using SPSS software finding Pearson's correlation coefficients to represent the relationship between the variables. The results follow in Chapter Four.

CHAPTER FOUR

RESULTS

This chapter presents the statistical results from the data analyzed while testing the following hypothesis: "As the self-perceived effectiveness of an interdisciplinary team increases, student achievement scores as measured by the Olathe school district reading assessment and Kansas reading assessment also increase." This chapter is structured into the following sections: (a) presentation of the descriptive statistics of the study which will also include a summary of teacher survey completion and student assessment data; (b) hypothesis testing for research question 1 highlighting the correlation between self-perception of the effectiveness of the interdisciplinary teacher team and students' academic results. This section also reviews the results for an additional test using only the items that measure instructional practices on the Interdisciplinary Team Audit to compare the relationship between the self- perceived teacher team effectiveness and student achievement as measured by the district and state reading assessment; (c) hypothesis testing for research question 2 which examined the relationship of students' socioeconomic status with the self-perception of teacher team effectiveness and student academic achievement as measured by the district and state reading assessment; and (d) a summary which reviews highlights from the study and introduces chapter five.

Descriptive Statistics

Interdisciplinary team self-perceived effectiveness was measured by the Interdisciplinary Team Audit (Presko, 1998). Table 6, located below, presents the descriptive statistics for the following variables of the study. Thirty interdisciplinary

teams representing a total of 115 individual teachers, or 76% of the total 7th and 8th grade core teacher population, completed the form, with three or more team members participating. From the original thirty-eight district interdisciplinary teacher teams, eight teams were not included in the study. Four of those eight teams (n = 16) were unable to complete the survey with three or more members. The other four teams (n = 16) coded student assessment information without the assigned interdisciplinary teacher team labeled. The researcher was unable to link student reading assessment scores with the interdisciplinary teacher team for these four teams. Therefore, the four teams with coding errors were also excluded from the study.

The study collected 2,493 student Olathe school district reading assessment scores and 2,493 Kansas State reading assessment scores that were reported as percent correct on the overall score. Student assessment results from seven of the eight junior highs were used to analyze the data. Junior high School 3 did not use a team code when labeling students reading assessment scores (n = 470) and, therefore, could not be included in the study since team and students could not be matched. In addition, students were excluded from two teams at School 6 (n = 200), one team from School 5 (n = 100), and one team from School 8 (n = 100) due to incomplete teacher survey data. A further 309 students were excluded overall because of incomplete reading assessment data. This means that one or both of the reading assessment scores used in this study for analyzing data was missing.

The first column of Table 6, for school Socioeconomic Status (SES) highlights that, in the seven participating junior high schools, the percent of students falling under the federal requirements for free and reduced price lunches had a range of 32.57%, from

a minimum of 3.70% to a maximum of 36.27%, with a mean of 11.50% of low SES students. The SES category shows one of the larger amounts of variability of any of the variables in this study, with a standard deviation of 12.02% from the mean score.

The second column in Table 6 displays the Interdisciplinary Team Audit data. Teachers completed the Interdisciplinary Team Audit, which consisted of 30 items in four major constructs: Instructional Practices, Student Orientation, Team Organization, and Team Structure. The Interdisciplinary Team Audit is scored using a nine-point Likert scale. An average for the team teachers was used to determine the team's self-perception of effectiveness on the various constructs of the Audit. A score was found for each team prior to the statistical analysis. It is also worth noting that the scores were all relatively high in comparison to the nine-point scale with the minimum at 6.05 and the maximum at 8.26. Using the average score from each of the thirty teams, the mean score for the teacher teams was 7.34 on the 9 point scale. A standard deviation of .47 demonstrated that all of the scores tend to be positioned together with very little variance. Additional statistics were calculated for an individual construct of the Audit focused on Instructional Practices and is found in the third column on Table 6. The Instructional Practices construct score, which focuses mostly on classroom activities and teaching strategies, a range of 3.38 was noted, with the minimum at 4.75 and the maximum at 8.13. The mean 6.97 dropped slightly in comparison to the overall mean of the total Audit at 7.34. When comparing the total team survey score to the Instructional Practices survey score the maximums between the Audit scores were similar. The minimum scores between the total team survey score and the Instructional practices construct survey score demonstrated a two point difference. This indicates some teams rated themselves lower

in instructional practices then they did as a total on the survey. The following are examples of statements from the instructional practices construct of the Audit for teams to rate their effectiveness; "Team members integrate curriculum; Team members stress basic skills across each content area; and Team members use activities/lessons which require problem-solving skills and creativity" (Presko, 1998).

Looking at the fourth column of Table 6 showed results for the district reading assessment. There was a range of 100, with a minimum score of 0 (zero correct and/or combination of incomplete work) and a maximum score of 100 being reported. It should be noted that the mean score among almost 2,500 student scores was 73.94. In addition to the mean, the median score was 78.00. This median score demonstrated that 50% of the students scored better than 78.00 on the district reading assessment.

The fifth column of Table 6 highlights descriptive data from the Kansas reading assessment. A range of 81 was reported, with a minimum score of 19 (minimum possible is 0 with a possible combination of missed questions or incomplete work) and a maximum score of 100. The Kansas reading assessment recorded a mean score of 80.82. It is also important to note that the median was 84, demonstrating once again that 50% of the scores are better than 84.

Table 6

Descriptive Statistics (School Year 2006-2007)

	School SES	Teacher Team Audit Score	Instructional Practices Construct Score	District Reading Score	KS Reading Score
Valid *N*	2493	30	30	2493	2493
Mean	16.91	7.34	6.97	73.94	80.82
Median	11.50	7.30	7.14	78.00	84.00
Std. Dev.	12.02	0.47	0.60	16.90	12.85
Range	32.57	2.21	3.38	100.00	81.00
Minimum	3.70	6.05	4.75	0.00	19.00
Maximum	36.27	8.26	8.13	100.00	100.00

Additionally, descriptive statistics for this study include frequencies. Frequency tables represent the number of times a particular data point occurs throughout the entire data set. Results for the frequencies of Low SES are found in Table 7 below.

Table 7

School Low SES Frequency Table (School Year 2006-2007)

School	Low SES Percent by School	Frequency	Percent of Sample	Cumulative Percent
School 1	3.7	461	18.5	18.5
School 2	7	491	19.7	38.2
School 7	11.5	527	21.1	59.3
School 6	22.33	268	10.8	70.1
School 5	31.2	266	10.7	80.7
School 4	33.13	235	9.4	90.2
School 8	36.27	245	9.8	100
	Total	2493	100.0	

It is noted that, as Low SES increased, the number of student participants in the study actually decreased. A little over 70% of the study sample attends a school where the total percent of Low SES is under 25% of the school's students.

Two additional frequency tables are found in the appendix G and H. Table G records information regarding the Kansas assessment data, while Table H reviews data collected for the district reading assessment. Table G shows a particular score and the number of times a student in the study scored it on the Kansas reading assessment. The percent column points out the percent of the student population scoring at the designated score. In the cumulative percent column there is a running total of percent of the student population scoring at or below each score. Therefore, the final row is the cumulative column and will always show 100% because it represents all of the scores in the study. A

highlight of the Kansas assessment data reveals that a little over 45% of the students score within the 10-point range of 86 to 96 on the assessment. A score of 93 represents the mode, the most commonly seen assessment score from students. The lowest score of 19 is recorded by a single student; the highest score of 100 was also achieved by only a single student.

Table H is a frequency table for the district reading assessment. Frequencies from the district reading assessment show that 50% of the students scored above 77 on the assessment. The following scores 76, 78, 84, 87, and 89 were achieved by more than 100 students. Twenty-six students scored the minimum possible (0), while two students achieved the maximum possible (100).

Hypothesis Testing

Question #1

The following section describes the results of the study in relation to the hypothesis: As the self-perceived effectiveness of an interdisciplinary team increases the academic performance of students also increases. Using SPSS, Pearson correlation coefficients were calculated to measure the direction and strength of the relationship that exists between the teacher team survey scores and the student Olathe School District and Kansas reading assessment scores.

Table 8

Correlation Data (School Year 2006-2007)

	Instructional Practices Survey Score	District Reading Score	KS Reading Score
	(Cases 2,493)		
Teacher Survey Score	.883 **	.068 **	.043 *
Inst. Practices Survey Score		.078 **	.039 *

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Table 8 is a matrx of the statistical analysis of the Pearson coefficients using SPSS. Each variable in the study is compared with the others to demonstrate the strength and direction of the relationships that exists. Although the correlations that are significant at the 0.01 level are noted with a double asterisk (**), the 0.05 level of significance was used in this study. Those correlations are asterisked (*) in the table. The hypothesis that student achievement (as measured by the Olathe School District and Kansas reading assessments scores) would increase as the self-perceived effectiveness of an interdisciplinary team increased (as measured by the teacher team survey score) was supported. A positive correlation represents the increase in teacher team self-perception of effectiveness and increased student scores on the Olathe School District reading assessment. The relationship is weak, but statistically significant ($r = .068$, $p < 0.01$). A positive correlation also demonstrates that, as teacher team survey scores increased, the Kansas assessment scores of the students also increased. The relationship was weak, but

statistically significant ($r = .043$, $p < 0.05$). The team instructional practices survey (those items from the teacher team survey that focused only on teaching practices) score and the students' Kansas Assessment score also demonstrated a weak but statistically significant positive relationship ($r = .039$, $p < 0.05$).

Question #2

The following section describes the results of the study in relation to the following question: Does the percentage of Low SES students (those students receiving free and reduced price lunch) impact the relationship between the self-perceived effectiveness of an interdisciplinary team of teachers and student academic achievement? The same hypothesis was used to investigate this second research question. It was hypothesized that as the self-perception of effectiveness of the interdisciplinary team of teachers increases student reading assessment scores will also increase. This second research question was also investigated using Pearson's coefficients, but was organized in a slightly different manner. The interdisciplinary teams were divided into two groups; schools with a high percent of Low SES and schools with a low percent of Low SES. To form the two groups, the seven schools were placed in order of percent of Low SES. The three schools with the highest percent became the group with the high percent of low SES students while the low percent of Low SES group consisted of the three schools with the lowest percentages of Low SES students. The school which fell right in the middle was divided with one team included in each of the two groups. The organization of the data within each of the groups remained the same concerning the team teacher survey score and the student assessment scores. The coefficient for the group of teams with a low percent of low SES students was calculated to show the relationship between the self

perceived interdisciplinary team effectiveness and student academic achievement. The same coefficient was calculated for the group of teams with a high percentage of low SES students and then the two sets of data results were compared.

Table 9

Correlation Data High Percent of Low SES (School Year 2006-2007)

	Instructional Practices Survey Score	District Reading Score	KS Reading Score
	(Cases 1, 178)		
Teacher Survey	.891 **	.080 **	.033
Inst. Pract. Survey		.082 **	.021

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Table 9, above, records the statistical analysis of the Pearson coefficients using the SPSS for teams from schools with a high percent of low SES students. A weak but positive statistically significant correlation measured the relationship between the teacher team survey and the Olathe School District reading score ($r = .080$, $p < 0.01$). When looking at the construct for instructional practices on the teacher team survey the district assessment also demonstrated a weak, positive but statistically significant correlation ($r = .082$, $p < 0.01$). In terms of the relationship between the Kansas reading score and the team teacher survey score, there were no statistically significant correlations to report. However, it does show the continued positive relationship trend as with the team teacher survey and the Olathe School District reading score.

Table 10

Correlation Data Low Percent of Low SES (School Year 2006-2007)

	Instructional Practices Survey Score	District Reading Score	KS Reading Score
	(Cases 1, 315)		
Teacher Survey Score	.858 **	.015	.004
Inst. Practices Survey Score		.019	-.008

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Table 10, above, records the statistical analysis of the Pearson coefficient using the SPSS software for teams from schools with a low percent of low SES students. There was no significant correlation between the teacher team survey score and the students' Olathe School District reading score. The same is also true of the relationship between the teacher team survey and the Kansas reading score with no significant correlations to report.

Additional Analyses

By completing the initial analyses of the data points, additional correlation coefficients resulted between the studies variables being compared with one another. The following data does not answer the original two study questions which guided this research but was none-the-less determined to be a useful finding of the study.

Table 11

Additional Analyses Correlation Data (School Year 2006-2007)

	Teacher Team Survey	Instructional Practices Survey Score	District Reading Score	KS Reading Score
	(Cases 2,493)			
The School's Percent of Low SES Students	-0.377**	-0.514**	-0.098**	-0.099**

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Of interest with these data are the results when looking at the relationship between the percent of Low SES student population and the teacher team self-perception survey score. Noted at a significance level of 0.01 there is the moderate, negative, statistically significant relationship. As the percent of Low SES students increased the teacher team's perception of its effectiveness decreased ($r = -.377$, $p < 0.01$). Also of interest is the relationship between the teacher team survey and the instructional practices construct which shows a moderate, negative, statistically significant correlation. As the percent of Low SES students increased the teacher team's perception of its effectiveness in the area of the instructional practices construct decreased ($r = -.514$, $p < 0.01$). The student assessment score results are also of great importance in the outcomes of this study. Reported as a weak, negative, statistically significant correlation is data showing that as the percent of Low SES students increases, the Olathe School District reading

score decreases (r = - 0.098, p < 0.01). A similar weak, negative, and statistically significant correlation is reported for the relationship between the percent of low SES students and the Kansas reading score (r = - 0.099, p < 0.01).

Summary

In summary, this chapter provided information describing outcomes from the data collected during the research study. An emphasis was placed on the results of the interdisciplinary team survey score in relationship to the students' assessment scores. The hypothesis of the study stated that as the self-perceived effectiveness of an interdisciplinary team increases (as measured by the teacher team survey score), the students assessment scores (as measured by the Olathe School District and Kansas reading assessments) will also increase. The correlation demonstrates that as teacher team self-perceived effectiveness survey score increased, the Kansas reading assessment scores of the students also increased (r = 043) at the .05 significance level. The same significance level is true of the relationship between the self-perceived effectiveness of the interdisciplinary teacher team instructional practices survey (those items from the teacher team survey focused only on teaching practices) score and the students' Kansas reading assessment scores with a Pearson correlation coefficient r = .039. This chapter also highlighted additional correlations discovered as a result of SPSS calculations between all the variables in the study. Noted was the statistically significant, negative relationship between the percent of Low SES students and the teacher team survey scores. Chapter Five provides additional discussion regarding the implications of the results from this study and the possibilities on future actions.

CHAPTER FIVE

INTERPRETATION AND RECOMMENDATIONS

Introduction

Educators of middle level students face unique challenges as they attempt to meet the academic and developmental needs of students between the ages of 10 and 15. Compared to the development of a child ages birth to two years, young adolescence is a distinct period of emotional, physical, and social growth for middle level students. The plethora of body and brain changes experienced by the young adolescent requires that teachers use a variety of instructional practices and organizational structures to address the educational needs of this unique age group (NMSA, 2004). The organizational structure of interdisciplinary teaming affords middle-level teachers time to collaborate and address the developmental needs of middle-level students as well as assist middle level students in making connections and building relationships with others in the team organization. Characteristics of highly effective interdisciplinary teams (defined in detail in Chapter Two of this study) have been identified by researchers from the National Middle School Association. Effective interdisciplinary teams practice the following essential components of teaming:

1. Student-centered focus.
2. Strong commitment to academic achievement.
3. Collaborative policies and accountability systems.
4. Strong sense of team community.
5. Regular communication with parents.

6. A proactive approach.
7. Teachers who work professionally and collaboratively (George, 2003).

A key component to successful middle level education is the effective collaboration of interdisciplinary teams. Mertens and Flowers (2004) suggest that teaming through its personalization of learning has the potential to positively impact the school culture and climate which will ultimately support learning and improved academic performance by young adolescent students.

Study Summary

The researcher hypothesized that, as the self-perceived effectiveness of an interdisciplinary team increases, student achievement would also increase. The self-perception of effectiveness of the team was measured through use of The Interdisciplinary Team Audit. This instrument consisted of ten constructs representing interpersonal communication, parent/community communication, empowerment, team leadership, common planning time, classroom proximity, scheduling, curriculum, management of student behavior, and team activities. The Interdisciplinary Team Audit was created based on concepts from research and literature on best practices at the middle level and was found to be a reliable and valid test in measuring the effectiveness of interdisciplinary teams (Presko, 1998).

Overview of Problem

With only 28% of eighth graders in the U.S. performing at the proficient level on the 2000 National Assessment of Educational Progress assessments, concerns about middle level education and the low level of academic achievement of students is rising (SREB, 2001). Poor academic performance, as well as the added costs associated with

the implementation of interdisciplinary teaming, has this middle level organizational structure under scrutiny. Therefore, it is vital to determine whether the effectiveness of interdisciplinary teaming as an educational, organizational structure that makes a positive impact on student learning, achievement, and assessments.

Purpose Statement and Research Questions

The purpose of this study was to identify the relationship between the self-perceived effectiveness of an interdisciplinary teacher team and student academic performance as measured by district and state reading assessments.

The research questions were:

1. What is the relationship between the self-perceived effectiveness of an interdisciplinary team and student academic achievement?
2. Does the percentage of Low SES students (those students receiving free and reduced price lunch status) impact the relationship between the self-perceived effectiveness of an interdisciplinary team of teachers and student academic achievement?

Review of Methodology

Interdisciplinary team effectiveness was measured using The Interdisciplinary Team Audit, and student academic achievement was measured by the Olathe school district and the Kansas state reading assessments. Seventh and eighth grade students in the Olathe District School were selected as the sample representing the larger population of middle- school aged students. The teachers selected for the study, as a sample of the larger population, focused their work with students in grades seven and eight and worked on interdisciplinary teams of four teachers in the Olathe District School. Student reading

scores were collected using results from the Olathe School District and Kansas state reading assessments, each of which assess a variety of reading indicators representing skills of knowledge and application. All reading assessment scores were reported as an overall percent correct. The mean score for each interdisciplinary team was figured according to their results as being highly effective to less effective, based on the characteristics assessed on the Interdisciplinary Team Audit. Individual student scores were collected for the District Reading Assessment and the Kansas State Reading Assessment by interdisciplinary team. Data were analyzed using SPSS to determine the strength and direction of the relationship between the study's variables (teacher team self-perception of effectiveness and student achievement as measured by the district and state reading assessments).

Major Findings

In reviewing research question 1, the weak, positive correlation demonstrates that, as teacher teams' self-perceived effectiveness survey score increased, the Kansas reading assessment scores of the students also increased. A similar weak, positive correlation was noted between the self-perceived effectiveness of the teacher team instructional practices construct survey (those items from the teacher team survey focused only on teaching practices) score and the students' Kansas reading assessment score. Research question 2 revealed a negative, statistically significant relationship between the increased percentage of Low SES students and the decreased student reading assessment scores. However, it was also noted that within the study of Low SES students a weak, positive correlation was found between the increase in teacher team self- perception and student increases in reading assessment score.

As the result of the additional analyses, the following variables demonstrated a statistically significant correlation. First, as the schools' percentage of Low SES students increased, the student reading scores decreased on both the Olathe School District and Kansas reading assessments. This correlation echoes the research which highlights at-risk or underprivileged students' lack of academic performance and struggle with school performance. Secondly, the results showed that, as the schools' percentage of Low SES students increased, the teacher teams' self-perceived effectiveness decreased. This negative correlation provided additional connections to interdisciplinary teaming not originally identified in the research questions as an area of focus. However, its value and impact to future study opportunities and action implications can not be discounted.

Findings Related to Literature

Chapter Two reviewed a chronological look at research from the middle level. Felner's (1997) and Flowers et al.'s (1997) research began an emphasis on data collection in support of instructional practices and organizational structures at the middle level which would meet the educational and developmental needs of young adolescents. Felner's study created the Middle Grades Self- Study as a data collection tool to assess schools' implementation of middle level concepts, teaming organizational structure, and instructional best practices. Using the Middle Grades Self-Study, Flowers et al., in the Michigan Middle Start Initiative, found that schools with the highest level of implementation of middle level concepts and practices, including interdisciplinary teaming, demonstrated significantly higher student achievement, as shown in the scores reported on the Michigan Educational Assessment Program (MEAP). Teaming schools reported increases of four percent or more on the reading and math portions of the

MEAP. This current study used The Interdisciplinary Team Audit (Presko, 1998) to assess interdisciplinary teacher team self- perception of effectiveness and the relationship to student achievement as measured reading assessments. In contrast to the firm results from Felner's (1997) and Flowers et al.'s (1997) studies, this research reported a weak, positive, significant relationship between an increase in the teacher self-perception of effectiveness as an interdisciplinary team and increased student achievement on the Kansas reading assessment. These current findings do, however, align with weak, positive results seen in the Indiana Project (1997), a follow up to the initial Michigan Middle Start (1999), and the Wallace (2007) which provided support the overall ideal of interdisciplinary teaming and its positive impact on student growth, development, and achievement.

Recommendations for Future Research

The process and results of this study provide additional opportunities for future research topics. As a result of using The Interdisciplinary Team Audit to assess the teachers' perception of their effectiveness as an interdisciplinary team, a future inquiry should include use of the same tool to collect data from multiple sources regarding an individual interdisciplinary team's effectiveness. For example, a researcher should survey the team teachers as well as the team's principal, and students. Parents should also be included because data collected from the parent perspective on team effectiveness will provide a new dimension of analysis. The significance of parental input is especially valuable when taking into account the review of literature, which describes the fears and questions associated with middle school and young adolescent years that parents also experience.

Future studies will also provide evidence from different variables. This study used teacher team self-perception of effectiveness as the independent variable and student achievement as measured by the Olathe school district and Kansas reading assessments as the dependant variable. Further inquiries could review dependant variables that include options such as other content area assessments, grades, behavior or office referrals, attendance, student strength inventories, and/or student performance projects and/or performance assessments.

In reviewing the results which demonstrated a decrease in teacher team self-perception of effectiveness as schools' percentage of low SES students increased, future investigations could be made to determine if a similar trend is true at all levels of education, pre-k to 12th grade. In addition, it will be valuable to determine why team teachers feel less effective when working at schools with higher percentages of low SES students.

Implications for Action

Review of the study as a whole provides several implications for general knowledge and theory as related to the implementation of interdisciplinary teaming at grades seven and eight. Weak significant correlations were found linking an increase in an interdisciplinary team's self-perception of effectiveness to students' improved academic achievement, as measured by increased scores on the Olathe School District and Kansas reading assessments. This finding is a small contribution to the literature which supports the implementation of interdisciplinary teaming practices at the middle level in order to positively impact young adolescent academic as well as developmental growth. It also demonstrates the need for consistent implementation of teaming in all

buildings and with all students. Using this study's review of literature about the characteristics of effective teams, as well as other teaming resources, and by receiving further input from interdisciplinary teams about effective practices, a common-expectations teaming handbook would be a valuable addition to the training provided at the building level for Olathe interdisciplinary teams. Continued data collection in the Olathe District Schools would provide a greater research base and a longitudinal study into teacher team effectiveness and student performance.

Also fundamental to the weak but statistically significant findings of the current study are the correlations showing decreased student performance as the percent of Low SES students increased and a decreased teacher team self-perception of effectiveness at schools with larger percentages of Low SES students. Although these findings lead to various opportunities for future study, there is an immediate need for support, training, and the establishment of guidelines for what success looks like when working with an at-risk population or in schools with large percentages of Low SES students. Teachers in school with larger percentages of Low SES students need to identify the common elements which make them successful in teaching and reaching young adolescent students in these schools. The study results confirmed the weak relationship, even among these high percentages of Low SES schools, with increased teacher team self-perception of effectiveness and student increased achievement.

Summary

In ways similar to the research results of Felner et al. (1997), Flowers et al. (2000), Lipsitz et al. (1997), and Wallace (2007), the current study contributes to the literature by adding results that appear to support the hypothesis that interdisciplinary

teaming positively influences student performance. In reviewing the results of the historic studies from chapter two and the analysis of data collected during the current study, it is this researcher's opinion that there is not just one solution as the definitive answer to educating today's young adolescents. In truth, it is the combination of middle-level philosophy and practice, together with the commitment from competent, caring educators to make a difference for every young adolescent, which ultimately ensures the success of students both personally and academically.

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Appendix A: The Interdisciplinary Team Audit

THE INTERDISCIPLINARY TEAM AUDIT (ITA-R)

Directions

Respond according to your perception of how well each statement relates to the overall functioning of your interdisciplinary team. Circle the number which indicates the degree to which your team exhibits each specific statement. i.e. "How effective is your team on each concept?"

1	2	3	4	5	6	7	8	9
NOT EFFECTIVE				MODERATE EFFECTIVE				HIGHLY EFFECTIVE

Items	How effective is your interdisciplinary team? Not Moderate Highly
1. Team members use evaluative data from students to assess their programs and practices.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
2. Team members stress basic skills across each content area.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
3. Team leaders keep team members on task during team meetings.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
4. Team members are provided with common planning time during the school day.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
5. Team members integrate curriculum.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
6. Team members show respect towards teachers and students with whom they work.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
7. Team members record minutes and decisions made during team meetings.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
8. Team members' classrooms are located in the same area of the building.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
9. Team members use parents/community members as volunteers in their classrooms or to help with special events and activities.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
10. Team members show concern for students as well as subject matter.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
11. Team leaders use meetings with the administration to discuss team concerns and issues.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
12. Team members' classrooms are adjacent to one another.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
13. Team members provide exploratory experiences for students.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9

Items	How effective is your interdisciplinary team? Not Moderate Highly
14. Team members use activities/lessons which require problem-solving skills and creativity.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
15. Team leaders coordinate team activities as a responsibility of their job.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
16. Team members share the same group of students.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
17. Team members collaborate to eliminate curricular objective duplication.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
18. Team members provide a safe classroom environment for students.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
19. Team members use team building activities to create a sense of identity and community among teams of students.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
20. Team members show compassion. flexibility and tolerance when working with students.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
21. Team members provide information to the community about middle school programs.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
22. Team members provide students with curriculum that focuses on the acquisition of knowledge, skills. and personal development.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
23. Team members use small and large groupings when delivering instruction.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
24. Team members use common planning time to identify and diagnose student needs.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
25. Team members use activities to promote tolerance and appreciation for cultural diversity.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
26. Team members provide students with opportunities to demonstrate responsibility.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
27. Team members use flexible scheduling to provide needed time for various classroom activities.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
28. Team members utilize other staff personnel such as counselors. specialists etc. during common planning time to meet students' needs.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
29. Team members integrate curricular activities to aid in providing modifications for students with I.E.P.s.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9
30. Team members utilize an interdisciplinary focus which helps apply knowledge and skills across disciplines.	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9

Appendix B: Permission from Dr. Kimberly Presko for use of The Interdisciplinary Team Audit

From: "Kim Presko" <kpresko@columbia.k12.mo.us>
To: <mcaldwellirc@olatheschools.com>
Date: 12/27/2006 9:53 PM
Subject: Re: Doctoral Request

Marlena-

Thank you for contacting me regarding my research. I would be happy to give you permission to use my Interdisciplinary Team Audit to use for your dissertation. Did you get a copy of the ITA, or do you need for me to send you one. If so, I will see if I can hunt one down to send to you. If I do not respond in the next week or two, please send me a reminder.

Kim

Dr. Kim Presko
Principal
Oakland Junior High
Columbia Public Schools
573-214-3220
>>> "Marlena Caldwell" <mcaldwellirc@olatheschools.com> 12/23/06 7:15 PM
>>>
Hello Dr. Presko,
I am an educator in the Olathe District School in Olathe, Kansas. I am also in a doctoral program at Baker University. My interest has been in middle level education and in review dissertations yours came my way on the subject of teaming. I would like to use the team audit that you created in your disseration for collecting data for comparison in my dissertation. I am requesting permission to use the team audit tool you created. Are there any specific processes I need to follow in order to gain permission to use your tool for data collection in my research? I appreciate the time you take in responding and directing me in this step of my project.
Enjoy your holiday break!
Marlena Caldwell

Marlena M. Caldwell
Secondary Instructional Resource Teacher
Assessment Instructional Resource Teacher
Olathe District Schools
913.780.7006
mcaldwellirc@olatheschools.com

****

Appendix C: Permission for Research Granted from Olathe District Schools

Olathe
Unified School District 233

February 20, 2007

Marlena Caldwell
Instructional Resource Center

The research project, *"Effective Interdisciplinary Teams and Student Achievement"* has been approved with the following criteria:

- The project goals are aligned with the district and building school improvement goals.
- Schedule audit with buildings teams during mutually set dates and times.
- Dr. Jan Heinen, Director Middle Level Education, Olathe School District, will serve as district contact for the project.
- A summary report should be submitted following the completion of your project. Please submit the report to me at the address listed below.

Olathe staff members look forward to working with you throughout the project. If you should have any questions or require any assistance, please contact me at the R.R. Osborne Instructional Resource Center (913-780-7006).

Sincerely,

Barbara Russell

Barbara Russell
Research Project Facilitator

R.R. OSBORNE
Instructional Resource Center
14090 Black Bob Road, Olathe, Kansas 66062
Bus. (913) 780-7006 Fax (913) 780-8158
www.olatheschools.com

Appendix D: Permission for Research granted from Baker University

19 March 2007

Marlena Caldwell
1891 W. Elm Terrace
Olathe, KS 66061

1858
BAKER
UNIVERSITY

Dear Ms. Caldwell:

The Baker University IRB has reviewed your research project application (M-0038-0307-0319-G) and **approved** this project under Exempt Review. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

The Baker University IRB requires that your consent form must include the date of approval and expiration date (one year from today). Please be aware of the following:

1. At designated intervals (usually annually) until the project is completed, a Project Status Report must be returned to the IRB.
2. Any significant change in the research protocol as described should be reviewed by this Committee prior to altering the project.
3. Notify the OIR about any new investigators not named in original application.
4. Any injury to a subject because of the research procedure must be reported to the IRB Chair or representative immediately.
5. When signed consent documents are required, the primary investigator must retain the signed consent documents for at least three years past completion of the research activity. If you use a signed consent form, provide a copy of the consent form to subjects at the time of consent.
6. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.

Please inform Office of Institutional Research (OIR) or myself when this project is terminated. As noted above, you must also provide OIR with an annual status report and receive approval for maintaining your status. If your project receives funding which requests an annual update approval, you must request this from the IRB one month prior to the annual update. Thanks for your cooperation. If you have any questions, please contact me.

Sincerely,

Marc L Carter, PhD
Chair, Baker University IRB

CC: Willie Amison; file

P.O. Box 65, Baldwin City
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Appendix E: Memo to Olathe District Schools Jr. High Principals and Team Teachers

Olathe District Schools

Memo

To: Olathe Junior High Principals; 7th and 8th grade Team Teachers

From: Marlena M. Caldwell

CC: Instructional Resource Teachers, Institutional Review Board, Select members of Project Committee, and Dr. Jan Heinen

Date: March 6, 2007

Re: **Interdisciplinary Team Audit**

Research Assistance Requested – your participation is requested for a doctoral dissertation project measuring effective interdisciplinary teams and student academic achievement.

The Olathe District Schools uses an interdisciplinary team model at grades seven and eight in the current junior high configuration. With today's high stakes for assessment and student achievement results there is a constant focus on best practices. This research project will collect data to compare team effectiveness as measured by the Interdisciplinary Team Audit, to student achievement as measured by the Kansas State Reading assessment.

On one of the following date March 13th or March 14th, I am requesting that all 7th and 8th grade interdisciplinary team teachers complete the Interdisciplinary Team Audit (ITA) during part of their team duty period. The ITA is basically a survey with thirty items based on the following four factors.

1. Instructional Practices – measures the degree to which team members integrate curriculum, implement effective instructional practices, and evaluate student learning.
2. Student Orientation – addresses the team teachers' responsibility for student success both academically and socially
3. Team Organization – measures effectiveness of team responsibilities
4. Team Structure – addresses the implementation of processes of teaming such as shared students, common planning time, etc.

The ITA will be administered and collected by one of the District's Instructional Resource Teachers. Each Interdisciplinary team will be assigned a number and that will be the only identification on the ITA. No teacher names will be printed on these forms. I look forward to your participation. If you have questions or would like further information please contact me at the follow:

Marlena Caldwell e-mail: mcaldwellirc@olatheschools.com

Phone: 913.780.7006

Team teachers will be contacted by an IRT to schedule the specific day, time, and meeting place.

Thank you

Appendix F: Additional Notice sent to Teachers

Dear 7th and 8th grade Team Teachers:

This is a follow up e-mail to the official letter you received requesting permission for your participation and help with a doctoral clinical research project. In a day or so, a research assistant (an IRT) will set up a time to visit your team planning time to distribute the teacher survey and answer any additional questions regarding the research and use of information provided. Please note that all materials will be number coded to facilitate anonymous participation on both the teacher survey and student assessment results.

Thank you for your careful considerations and participation. Please let me know if you have additional questions.

Sincerely,
Marlena Caldwell
Baker University Graduate Student

Appendix G: Kansas Reading Assessment Frequency Table

Table G

Kansas Reading Score Frequency Table

Score	Frequency	Percent	Cumulative Percent
19	1	.0	.0
22	1	.0	.1
28	1	.0	.1
29	1	.0	.2
33	1	.0	.2
34	3	.1	.3
35	3	.1	.4
36	1	.0	.5
37	4	.2	.6
38	2	.1	.7
39	1	.0	.8
40	2	.1	.8
41	5	.2	1.0
42	4	.2	1.2
43	6	.2	1.4
44	2	.1	1.5
45	8	.3	1.8
47	8	.3	2.2
48	11	.4	2.6
49	11	.4	3.0
50	4	.2	3.2

51	16	.6	3.9
52	9	.4	4.2
53	12	.5	4.7
54	16	.6	5.3
55	15	.6	5.9
56	8	.3	6.3
57	10	.4	6.7
58	14	.6	7.2
59	17	.7	7.9
60	22	.9	8.8
61	21	.8	9.6
62	4	.2	9.8
63	28	1.1	10.9
64	25	1.0	11.9
65	21	.8	12.8
66	32	1.3	14.0
67	34	1.4	15.4
68	15	.6	16.0
69	42	1.7	17.7
70	25	1.0	18.7
71	41	1.6	20.3
72	33	1.3	21.7
73	31	1.2	22.9

74	41	1.6	24.5
75	61	2.4	27.0
76	55	2.2	29.2
77	64	2.6	31.8
78	37	1.5	33.3
79	60	2.4	35.7
80	84	3.4	39.0
81	69	2.8	41.8
82	76	3.0	44.8
83	93	3.7	48.6
84	67	2.7	51.3
85	77	3.1	54.4
86	79	3.2	57.4
87	122	4.9	62.4
88	117	4.7	67.1
89	118	4.7	71.8
90	114	4.6	76.4
91	57	2.3	78.7
92	109	4.4	83.1
93	132	5.3	88.4
94	94	3.8	92.1
95	75	3.0	95.1
96	62	2.5	97.6

97	16	.6	98.3
98	30	1.2	99.5
99	12	.5	100.0
100	1	.0	100.0
Total	2493	100.0	

Appendix H: Olathe School District Reading Assessment Frequency Table

Table H

District Reading Score Frequency Table

Score	Frequency	Percent	Cumulative Percent
0	26	1.0	1.0
15	2	.1	1.1
16	1	.0	1.2
17	2	.1	1.2
20	4	.2	1.4
21	1	.0	1.4
22	5	.2	1.6
24	2	.1	1.7
25	2	.1	1.8
27	4	.2	2.0
29	6	.2	2.2
30	4	.2	2.4
31	3	.1	2.5
32	8	.3	2.8
33	6	.2	3.0
35	10	.4	3.4
36	12	.5	3.9
37	11	.4	4.3
38	11	.4	4.8
40	14	.6	5.3
41	5	.2	5.5

42	8	.3	5.9
43	14	.6	6.4
44	12	.5	6.9
45	8	.3	7.2
46	6	.2	7.5
47	11	.4	7.9
48	12	.5	8.4
49	18	.7	9.1
51	22	.9	10.0
52	18	.7	10.7
53	13	.5	11.2
54	17	.7	11.9
55	14	.6	12.5
56	34	1.4	13.9
57	22	.9	14.7
58	13	.5	15.3
59	13	.5	15.8
60	38	1.5	17.3
62	46	1.8	19.2
63	23	.9	20.1
64	32	1.3	21.4
65	62	2.5	23.9
67	65	2.6	26.5

68	32	1.3	27.8
69	33	1.3	29.1
70	38	1.5	30.6
71	91	3.7	34.3
73	92	3.7	37.9
75	99	4.0	41.9
76	102	4.1	45.9
78	129	5.2	51.1
79	81	3.2	54.4
80	61	2.4	56.8
81	70	2.8	59.6
82	74	3.0	62.6
83	79	3.2	65.8
84	157	6.3	72.1
85	81	3.2	75.3
86	74	3.0	78.3
87	144	5.8	84.1
89	121	4.9	89.0
90	54	2.2	91.1
91	36	1.4	92.6
92	45	1.8	94.4
93	28	1.1	95.5
94	36	1.4	96.9

95	43	1.7	98.7
96	11	.4	99.1
97	13	.5	99.6
98	7	.3	99.9
100	2	.1	100.0
Total	2493	100	