A STUDY OF THE IMPACT OF DATA-DRIVEN COLLABORATION ON STUDENT ACADEMIC ACHIEVEMENT IN MATHEMATICS AND READING OF TESTED SUBGROUPS

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A STUDY OF THE IMPACT OF DATA-DRIVEN COLLABORATION ON STUDENT ACADEMIC ACHIEVEMENT IN MATHEMATICS AND READING OF TESTED SUBGROUPS

A Field Study Report

Presented to

The College of Graduate Studies

Austin Peay State University

In Partial Fulfillment

Of

The Requirements for the Degree

Education Specialist

Kimberlee E. Taylor

December, 2014

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To the College of Graduate Studies:

We are submitting a field study written by Kimberlee E. Taylor entitled "A Study of the Impact of Data-Driven Collaboration on Student Achievement in Math and Reading of Tested Subgroups". We have examined the final copy of this field study for form and content. We recommend that it be accepted in partial fulfillment of the requirements for the degree of Educational Specialists.

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DEDICATION

First, I would like to dedicate the completion of this project to my best friend and husband, Darryl Taylor. He provided me the opportunity to aspire to make my desire to further my education a reality. He kept me motivated and always believed that I could accomplish my goal. He was patient and understanding when I had to complete course work instead of spending time with him. His help, support, but most of all his love, gave me the strength to finish. I can only hope that I have made him proud.

This project is also dedicated to my grandmother, Leona Smith, who by her example, demonstrated how to walk in faith when life seemed beyond all hope. I would like to thank my parents, Kenneth and Linda Smith for their unconditional love and for never giving up on me. My mother passed away in February 1994, but I know she would be proud of me. My father has always loved and helped me even when I probably did not deserve it. I can never repay him for always being there for me. Daddy, thank you for teaching me that I can accomplish anything I desire, but most of all, thank you for your unconditional love.

This project is also dedicated to my son, Michael Smith. Thank you for loving and respecting me. I hope you have always known that I love you. I would also like to thank Daniel, Lisa, Lori, and Deanna Taylor for accepting and caring for me as part of your family. I am truly blessed to have you in my life. I love you all.

I also hope that when my grandchildren, Jada and Jaxon, are grown that somehow my perseverance inspires them to chase their dreams and make them a reality.

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I would like to thank the Director of Instruction and Curriculum for allowing me to conduct research in the school district and the District Accountability and Data Analyst for helping me access the data needed to complete this field study. I would also like to thank the academic coaches that willingly allowed me to interview them.

Finally, I would like to thank my Savior for giving me the strength and wisdom to finish this field study. Without Him, I truly believe I would have grown weary and would have lacked the knowledge necessary to finish.

ABSTRACT

The purpose of this study is to evaluate the impact of data-driven collaboration on student achievement in the academic content areas of Mathematics and Reading. In order to determine if data-driven collaboration does have an effect on student learning, Tennessee Comprehensive Assessment Program gain scores from the 2012-2013 and 2013-2014 school years were utilized to compare the following subgroups: female, male, majority, minority, economically disadvantaged, and non-economically disadvantaged. An elementary school that had practiced data-driven collaboration less than three years was compared to an elementary school that had practiced data-driven collaboration more than three years. A middle school that had practiced data-driven collaboration less than three years was compared to a middle school that had practiced data-driven collaboration more than three years was compared also.

The data analysis supports that data-driven collaboration does have an impact on student achievement in the content area of Mathematics with the following subgroups: majority, female, male, economically disadvantaged, and non-economically disadvantaged. However, the data does not show a significant difference in Reading scores.

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INTRODUCTION

Statement of the Problem

There is sufficient research and evidence that support data-driven collaboration and its impact on student achievement. In 2007 Goddard, Goddard, and Tschannen-Moran conducted a study to determine if collaboration has an impact on student achievement in public elementary schools. They used survey data and student achievement scores to determine the impact of collaboration. Based on the research, it was concluded that student achievement is higher in schools that reported having more collaboration with their colleagues. This was evident in schools of varying size and demographics (Carroll, Fulton, & Doerr, 2010).

Sadly, even though there is research to support the effects of data-driven collaboration, policy-makers and educators alike do not accept or promote it. According to a study conducted by Carrie R. Leana (2011), a professor at the University of Pittsburg, should policy-makers decide to invest in efforts that promote collaboration among teachers, then student achievement will increase. The study demonstrated that if schools are to show improvement, administrators must create social capital or collaboration among teachers. A below average teacher can perform as well as an average teacher with the appropriate collaboration.

Research by Wimberley (2011) supported the idea that teachers who collaborate have higher student achievement scores. The collaborative climates generated an environment that created a positive and professional learning community. The findings also indicated that schools that welcomed collaboration had higher teacher satisfaction. It was also found that schools that had been collaborating for longer periods of time had higher student achievement scores.

Research is appropriate and needed in this area in an effort to explore, study, and analyze the impact that data-driven collaboration has on academic achievement among tested subgroups in Reading and Mathematics.

Purpose of the Study

The purpose of this field study was to explore the impact of data-driven collaboration on student academic achievement of economically disadvantaged students in comparison to non-economically disadvantaged students, males in comparison to females, and the majority group compared to the minority groups. The independent variables are data-driven collaboration, gender, ethnicity, and socio-economic status, and the dependent variables are school Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores and the interviews of principals and academic coaches to determine the frequency and extent of the data-driven collaboration.

Determining the impact of data-driven collaboration in this school district is important in determining its effects on student achievement in general and closing the gaps among the various subgroups. The schools within the district are at various levels of collaboration and are moving toward data-driven instruction at various rates even though the research supports the utilization of data-driven collaboration. It would be advantageous for research to be conducted in this district on data-driven collaboration and improved student achievement among all demographics in order to make believers out of those resistant to the transition.

Significance of the Study

The research committee in the school district where the field study was conducted will benefit from this study. The committee will be able to use the analyzed data to determine if data-driven collaboration practices improve student achievement by closing the gaps of tested subgroups. The Accountability Coordinator in the district where this research was conducted will be able to use the statistical findings to determine if data-driven collaboration has an effect on closing the gaps of students in the tested subgroups in Reading and Mathematics based on Tennessee Comprehensive Achievement Program (TCAP) data and provide other schools within the district the research to improve their student achievement. The administrators and teachers in the district will benefit from the research findings in this field study by acquiring knowledge about whether Reading and Mathematics achievement scores improved or did not improve when data-driven collaboration was being implemented. Parents and students will benefit if the data demonstrates that data-driven collaboration when used to drive instruction improves academic achievement. Future researchers may benefit from the research findings resulting from this study for support of their own research studies on the same or similar topics.

Research Questions

The following research questions have been determined to be appropriate for this study:

1. What effect does data-driven collaboration have on Reading Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency NCE scores?
2. What effect does data-driven collaboration have on Mathematics Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency NCE scores?
3. Does data-driven collaboration have a greater impact on economically disadvantaged or non-economically disadvantaged students?
4. Does data-driven collaboration have a greater impact on males or females?
5. Does data-driven collaboration have a greater impact on the majority group or minority groups?
6. Does the length of time a school has been practicing data-driven collaboration have an effect on student achievement?

Null Hypotheses

Based on previous research the following Null Hypotheses are appropriate:

1. There will be no statistically significant difference in Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency NCE scores between the years of 2013 and 2014 of majority students in schools that have practiced data-driven collaboration more than three years as

compared to TCAP NCE scores of students in majority groups in schools that have practiced data-driven collaboration less than three years.

2. There will be no statistically significant difference in Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency NCE scores between the years of 2013 and 2014 of minority students in schools that have practiced data-driven collaboration more than three years as compared to TCAP NCE scores of students in minority groups in schools that have practiced data-driven collaboration less than three years.
3. There will be no statistically significant difference in Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency NCE scores between the years of 2013 and 2014 of female students in schools that have practiced data-driven collaboration more than three years as compared to TCAP NCE scores of female students in schools that have practiced data-driven collaboration less than three years.
4. There will be no statistically significant difference in Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency NCE scores between the years of 2013 and 2014 of male students in schools that have practice data-driven collaboration more than three years as compared to TCAP NCE scores of male students in schools that have practiced data-driven collaboration less than three years.
5. There will be no statistically significant difference in Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency NCE scores between the years of 2013 and 2014 of economically

disadvantaged students in schools that have practiced data-driven collaboration more than three years as compared to TCAP NCE scores of economically disadvantaged students in schools that have practiced data-driven collaboration less than three years.

6. There will be no statistically significant difference in Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency NCE scores between the years of 2013 and 2014 of non-economically disadvantaged students in schools that have practiced data-driven collaboration more than three years as compared to the TCAP NCE scores of non-economically disadvantaged students in schools that have practiced data-driven collaboration less than three years.
7. There will be no statistically significant difference in Mathematics Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency NCE scores between the years of 2013 and 2104 of students in schools utilizing data-driven collaboration practices more than three years as compared to the Mathematics TCAP NCE scores of students in schools that practiced data-driven collaboration less than three years.
8. There will be no statistically significant difference in Reading Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency NCE scores between the years of 2013 and 2014 for students in schools utilizing data-driven collaboration practices more than three years as compared to the Reading TCAP NCE scores of students in schools that practiced data-driven collaboration less than three years.

Limitations

The following limitations are appropriate to this study and the population served by the schools used for this study:

1. The first limitation in this study was that only one tool was used to measure growth of student academic achievement in Reading and Mathematics to determine the effects of data-driven collaboration. The Tennessee Comprehensive Assessment Program (TCAP) was the only test administered to elementary and middle school students in this study to measure the impact of data-driven collaboration in Reading and Mathematics.
2. The second limitation was the extent of the use of data-driven collaboration in the schools that participated in the study. Each school was at different implementation levels and did not have the same definition of data-driven collaboration based on the definition accepted as appropriate for this study and the schools and school system from which the student population was drawn.
3. The third limitation was that each teacher may participate in data-driven collaboration, but their fidelity in using the data to drive their instruction differed among teachers at each school and the impact of this will remain unknown from this study.
4. The fourth limitation was the high mobility rate in the district. The schools in the study had mobility rates ranging from 22 percent to 40 percent, which can impact the effectiveness of data-driven collaboration.

Assumptions

The following assumptions are appropriate to this study and the population, schools, and school system included in this study:

1. One assumption of this study was that all students performed to the best of their abilities on Tennessee Comprehensive Achievement Program (TCAP) tests in the spring of 2013 and 2014.
2. Another assumption in this study was that all teachers have received the same training on how to use data during collaboration and how to use it effectively to drive instruction in their classrooms.
3. One last assumption in this study was that all teachers use data with fidelity while they collaborate and in their instruction.

Definition of Terms

1. **Data-Driven Instruction:** The use of data to help drive instructional practices. There are four major areas of work related to data-driven instruction: culture, assessments, analysis, and action (Fenton & Murphy, 2014)
2. **Demographics:** Studies of a population based on components such as age, race, sex, economic status, level of education, income level and employment, etc. Demographics are used to learn more about a population's characteristics for many reasons (Investopedia, 2014).

3. **Professional Learning Community:** When everyone works together to find and share learning and react to that learning to improve their effectiveness as professionals so that students have the advantage (McREL, 2003).
4. **Economically Disadvantaged:** An individual from an economically disadvantaged family, including foster children. Those identified individuals are compared with free or reduced lunch eligible students (Tennessee Department of Education, 2013).
5. **Tennessee Comprehensive Assessment Program (TCAP):** A set of state-wide assessments given to measure student skills and progress. Student results are reported to parents, teachers, and administrators (Tennessee Department of Education, 2013).
6. **Normal Curve Equivalent (NCE):** The mapping of percentile data into corresponding points in a normal distribution. The purpose is to enable data to be analyzed consistent with the Value-Added Report and the Achievement Report on the Tennessee Report Card (Tennessee Department of Education, 2013).

CHAPTER II

REVIEW OF THE RELATED LITERATURE

Introduction

Over the past several years, educators have been scrutinized for students not being prepared for college or the workforce when they graduate from high school. Teachers have felt the pressures of tougher evaluation processes tied to achievement test scores and merit pay, but for some reason they still remain resistant to collaborating with their colleagues even if they are not meeting the requirements to maintain their teaching credentials. Research clearly indicates that there is a positive relationship between teacher collaboration and student achievement. It also indicates a strong correlation with new teacher retention (McClure, 2008). Using data to drive or shape classroom instruction, has also been shown to improve student achievement and close achievement gaps. It is imperative that educators begin using data-driven collaboration in order that every student graduate from high school and are unquestionably college or career ready when they transition to that next phase of their educational experience.

To understand how data-driven collaboration can be used to improve student achievement, educators need to understand the data that they have available to them through state achievement tests and classroom formative and summative assessments. Teachers also need to understand the value of the data they have at their fingertips. They need to understand how to analyze the data and how to use the data to drive or shape their instructional practices. Once educators realize and understand this, they can begin to use data-driven collaboration to improve student achievement and close the achievement gaps in learning of the students in their classrooms.

The Importance of Collaboration

According to McClure (2008), RAND researcher Cassandra Guarino and associates found that beginning teachers were more apt to stay in the profession when strong mentoring and induction programs were in place. New teacher retention rates were also higher in schools where all teachers shared the responsibility for student success. Guarino also surveyed 2,000 teachers who either worked, or had worked, in California and discovered that they felt considerable personal satisfaction when they trusted their self-efficacy, which was created through collaboration. According to McClure, a study conducted by Susan Kardos and Susan Moore Johnson found that new teachers were more likely to stay in schools that had a culture where new teacher needs were acknowledged and every teacher in the school shared the responsibility for the success of all students. Unfortunately, this is not the norm. McClure (2008) also cited a study conducted by Goddard and colleagues that found that student achievement improved when collaboration was centered on curriculum, instruction, and professional development.

In a study by Leana (2011), it was found that when teachers needed advice or had questions about their content, they usually turned to other teachers before they would go to or seek the advice of curriculum consultants or principals because they felt that it was too risky to admit their vulnerabilities to administrators and other leaders. This is known as social capital. When the relationships among teachers possess the attribute of trust along with the presence of numerous interactions, student achievement improves. The study also showed a relationship among higher gains in Mathematics achievement and how often teachers communicated with one another about Mathematics content. It was also discovered that low ability teachers with strong social capital could perform as well as average ability teachers. Leana (2011) discovered through research, that a correlation between social capital and increased student achievement developed, which could also be contributed to self-efficacy. Social capital was a better indicator of student achievement gains above teacher experience or teaching ability. When teachers collaborate, they are exposed to what other teachers feel is important and are better able to incorporate them in their classroom to meet their students' needs.

In Jack Berckemeyer's (2013) article, "Becoming a Team", he notes that teaming is essential and teaming is crucially importance to the ability of the team to be able to rally for a common purpose of the school. Berckemeyer (2013) also stressed the importance of the team developing a trusting relationship with each other in order to work together and reach the common goal. The purpose of the team is to improve all elements of the school experience including student achievement. When educators collaborate together, great things can and will happen. In order for effective collaboration to take place, the team must get to know one another outside of just school related topics or settings. Berckemeyer (2013) also stressed the importance of creating a team vision, mission, and norms.

There are four types of relationships: parallel play, adversarial, congenial, and collegial (Barth, 2006). Parallel play enables teachers to stay in isolation hiding what teachers do in their classrooms and keeping them from improving their classroom instruction. Educators create adversarial relationships through competition of resources and acknowledgement. This mentality causes educators to want the failure of their colleagues rather than help them to be successful for the students' academic success.

Congenial relationships are important for educators because it is what makes them want to go to school each day, but they do not bring collaboration and improved student learning alone. Collegiality is the hardest to accomplish within an organization, but it is highly valued by school reformers. When Barth (2006) visits a school, he looks for the following evidence of collegiality among teachers and principals.

- Teachers discussing practice with one another.
- Teachers sharing their expertise.
- Teachers observing one another as they engage in instruction.
- Teachers cheering each other for one another's success.

In order for school leaders to create a culture of collegiality, the leader needs to state expectations precisely, demonstrate collegiality, reward those that use collegiality, and protect those who engage in collegial behaviors. Success does not come alone; it comes from participating in an expert group known as colleagues (Barth, 2006). Collegiality is vital if student achievement is going to increase. Teachers need opportunities to talk about their practice, share their professional knowledge, observe one another teach, and encourage each other. School leaders should state expectations clearly, model collegiality, reward those who interact as colleagues, and protect persons who display collegial behaviors if they are going to promote collegiality among their faculty. These are the conditions necessary for positive change to take place.

DuFour and Mattos (2013) suggested that research demonstrates that educators in schools that have welcomed Professional Learning Communities (PLC) are more likely to share ownership of student learning, help students achieve at greater levels, and have higher personal satisfaction with their profession. When teachers share leadership and meet with a focus on the right work through Professional Learning Communities (PLC's), they improve student achievement and their personal professional application. There needs to be a culture where the responsibility of student achievement is shared through collaboration. DuFour and Mattos (2013) found that research demonstrates that educators in schools that promote Professional Learning Communities (PLC's) are more likely to share the responsibility for student learning by helping them learn at more rigorous levels, and express higher degrees of professional satisfaction. They share teaching strategies and results, discuss ways to improve instruction and student learning, and promote shared leadership. Teachers in these schools also participate in professional development that helps them grow and stay in the teaching profession.

Research has demonstrated the importance of collaboration among teachers for school improvement. Collaboration gives teachers the opportunity to enhance their practice in order to improve student achievement. Many schools have begun to recognize the importance of collaboration and have adapted their school schedules to ensure teachers have the time to collaborate, but many teachers are still having difficulty making the best use of their time. For collaboration to be effective, teachers need to have ideal conditions such as focus, collaborative skills, written group norms, and a discussion protocol. These conditions enable the time together to be productive. The discussion should also align with school and district goals (The Center for Comprehensive School Reform and Improvement, 2010).

Research clearly demonstrates that when teachers participate in professional development aligned to school initiatives, they are more likely to believe and support the notion that taking part in collaboration improved student achievement. Collaboration time should be focused on improving student achievement. In order to focus on student achievement, data should direct the discussion on how to improve student learning. Teachers also have to be willing to share what they learn with one another, and this requires a great deal of trust and professional respect among group members (The Center for Comprehensive School Reform and Improvement, 2010). When teachers begin to share their knowledge, it is a sign that teachers have begun to accept that they don't know everything and become learners as well as teachers. In order for real school improvement to take place, there needs to be structured collaboration with a focus on data and how to use the data to grow together.

In 2009, Jane David noted that collaboration is important because teachers work together to determine mutual challenges, analyze important data, and practice instructional strategies with a goal of improving student achievement. David (2009) strongly believes and emphasizes that collaboration is not the norm in most schools and does not occur on its own. Teachers have to be trained in appropriate collaboration skills, how to collect and use data, and the appropriate action to be taken based upon the results of the student data. Without training, teachers can become frustrated and stop the collaborative process. Evidence supports the notion that when educators collaborate, their knowledge increases, and they make positive changes in their instruction. Teachers also gain a better understanding of their students and how to meet their individual needs through collaboration. David (2009) suggested that teachers are more likely to become motivated and find value in inquiry if it is done through collaboration. Another discovery was that teacher created formative assessments provided more valuable data than standardized tests when it came to meeting the needs of their students. Collaboration is a hard strategy to implement but is one of the best for enhancing teaching and learning. Schools need to create a clear and common understanding of the purpose and importance of collaboration, and they need to meet regularly and have sufficient training in effective collaboration practices.

Roadblocks to Collaboration

How teachers view collaboration can be a roadblock. If teachers prefer to work alone or do not trust their colleagues, this can make it extremely difficult for teachers to be productive. Teachers may also see outsiders as interfering in their territory. Collaboration can be productive in a climate of positive critical inquiry. Some teachers may view this as judgmental and their weaknesses will be exposed. Another roadblock to collaboration is not being focused on collaboration and allowing the team to veer from the agenda to discuss personal situations or a perceived crisis. Not developing collaborative skills can result in a roadblock because the group lacks the knowledge of how to collaborate effectively. To keep these roadblocks from developing, groups should create written norms and discussion protocols that allow all group members to have the opportunity to participate (The Center for Comprehensive School Reform and Improvement, 2010).

Effective Collaboration

Communication and commitment are two necessary components of effective collaborative teams (Boettcher & McCann, 2013). When communicating with team members, it is essential that the discussions remain focused and data-based. Team members should be able to communicate without fear in order to meet the needs of students. Members must be willing to strengthen each other's areas of weaknesses or deficiencies and accept help when offered, if student achievement is going to improve.

In collaborative cultures, educators work together to employ creative leadership, and take responsibility for educating all students. The success of all improvement initiatives depends almost entirely on the attitudes of teachers. When teachers are provided multiple chances to collaborate with one another, they thrive by increasing their thinking, effectiveness, and the behaviors that lower the chances of improvement through change decrease (Kohm & Nance, 2009).

Principals who want a collaborative environment share leadership with teachers whenever possible. When teachers are involved in the decision-making process, they are more likely to take ownership of the problems and work to resolve them. A collaborative culture speeds up the faculty's ability to improve instruction. In order to create this type of culture, the principal needs to provide teachers with the necessary skills in order for collaborative problem-solving to be developed and nurtured. Principals should also be transparent by sharing information with everyone, discussing changes, and addressing failures as well as successes (Kohm & Nance, 2009).

Principals need to move away from being the person who establishes the goals to being the person that creates an environment that enables teachers to create their own goals. Teachers need to be provided with relevant data in order to set measureable goals for themselves and the students in their classrooms. Every teacher needs to feel like they have a voice in setting goals and making decisions. Progress toward goals should be evaluated throughout the school year in order for the collaborative team to become stronger and to increase student learning. The principal needs to make sure the goals are narrow and are obtainable. Collaborative cultures establish the confidence teachers need to influence each other and their students (Kohm & Nance, 2009). Collaborative cultures develop self-efficacy.

In a study conducted by Wimberley (2011), the research indicated that schools that collaborated effectively had higher student achievement. In collaborative schools teachers could obtain help with weaknesses and build on their strengths. Everyone had to be willing to accept constructive criticism, but the focus remained on increasing student achievement and improving departmental flaws. Teachers were committed to improving their teaching skills as well as understanding their students' learning. Through collaboration, teachers can develop effectiveness and a sense of belonging.

Through Wimberley's study, it was also discovered that the longer a school had been practicing teacher collaboration, the higher the level of teacher collaboration, and the more they shared common formative and summative assessments. It was also found that the longer the teachers had been collaborating, the higher the scores for student achievement. There was a higher rate of teacher satisfaction among teachers in these schools as well.

For effective collaboration to occur, there needs to be an action plan in place (Cummings, 2014). Effective schools set high expectations for their faculty, staff, and students. Teachers need to believe that more rigorous lessons in the classroom will have a positive impact on student learning. The high expectations need to be communicated to the students regularly and they need to be provided with the resources needed to be successful. Teachers need to build relationships with their students as well.

According to Cummings (2014), effective schools administer frequent assessments to determine student progress, practice collaboration among faculty and staff members, and have focused professional development. Assessments need to be given often to determine how teachers need to change or differentiate their instruction. Pre-assessments are a vital part of differentiating instruction in the classroom. They let teachers know if students have already mastered the material, inform teachers of student misconceptions, and allow for differentiation. Formative assessments are administered during instruction to give teachers and students immediate feedback and enable the teacher to change instruction if necessary. Summative assessments let teachers know how much of the material students have mastered and are often utilized as grades for the students. Collaboration allows teachers to share best practices, analyze data, and creates a sense of community. Principals need to provide teachers with a set time to collaborate in order for it to be productive. Teachers also need professional development and should be included in deciding what professional development is needed based on their needs.

Research has also proven that teachers need to focus on the right work when they meet. In Professional Learning Communities (PLC's), principals and educators, ask themselves the following questions (DuFour & Mattos, 2013):

> What should all students be able to do at the end of this unit of study; how much time should be spent on this unit; what assessments will we use to gather data about student learning as a team; and how can we use the data to improve instruction and differentiate instruction to promote increased student learning? (p. 37)

The Center for Comprehensive School Reform and Improvement (2010) provided research that stated in order for schools to have effective collaboration there should be a focus on improving teaching so student learning can improve. Teachers need to discuss student work including connections to the content standards, expectations for learning, and the use of rubrics in order to enhance teaching and student learning.

There are also personal steps to effective collaboration: build relationships, observe the best, as well as to ask questions, to share, and to come prepared. A benefit of building relationships, especially as a new teacher, is that other teachers get to know you by name and consider you a colleague not just as the "new teacher" down the hall. It is also important to observe other teachers often even if they teach a different content. The important thing is to observe teachers you want to be like. It is important to ask teachers questions after you observe them in order to implement what you have seen. It is also important to ask pertinent questions about student data, instruction, and discipline just to name a few topics. Teachers need to share their frustrations and to get answers from those that have had the experience already so they have the answers. Additionally, it is important to share what you have learned even if you think it is trivial because it can spark other ideas (Johnson, 2014).

Habits of Highly Collaborative Organizations

According to Jacob Morgan (2013), there are twelve habits of highly collaborative organizations even though they can have different cultures and goals. The first habit is for the leaders of the organization to lead by example. Otherwise, what will serve to motivate the employees to utilize and maintain the collaborative tools and strategies.

Leaders inspire change and promote desirable behaviors. Leaders also need to focus on the individual benefits of collaboration. People want to know how collaboration will make their jobs and lives easier, less complicated and simpler. Another habit that collaborative organizations need to possess is the ability to create a strategy to help its organization understand the "why" before they understand the "how". Without understanding of the "why", it is difficult to get people to accept and to support the "how". Leaders also need to stay out of the way of their employees. It is good to have best practices and guidelines, but not if they hinder collaboration from taking place. Employees should also play a vital role in making decisions. Leaders need to listen to their employees' ideas, needs, and suggestions and incorporate their responses into their best practices and guidelines. It is important for collaboration to fit in the natural flow of work. Employees should not view collaboration as additional work. Employees need to be compensated for collaborative work and receive adequate training and resources to help support the collaborative process. The organization should place an emphasis on measuring what matters to the success of the organization, not giving up, and continually moving forward. Collaboration should be not be an option. Collaboration should be THE option. It is also vital to understand that collaboration does not end. It continuously changes and becomes something new as the organization changes. Employee collaboration is good for the customer as well. If there is a problem, the employee can reach out to the staff for support in order to help the customer. Collaboration is important in that it allows employees to feel a part of their job, relieves stress, and gives employees more freedom. It increases job satisfaction.

Leadership Secrets of Collaboration

Bringing people together to achieve a common goal and maintaining focus and desire to achieve the goal is a test of leadership and the culture of the organization. Biro (2013) provided five ways to make intelligent collaboration happen. First, you should build an online structure for social learning and networking. This allows everyone to share and get to know one another. Social networks are open 24 hours a day and serve to build trust. Social networking is a valuable tool for collaboration.

Secondly, Biro explains that the group needs limits in order to develop a respect among the members for everyone's space. Some may want to limit the discussion to the goal of the collaboration and not branch out into personal conversations. Everyone needs to respect the boundaries set by those in the group. Remember, to get the work done first, and then move on to more personal discussions. Personal relationships are important when building a collaborative culture.

Biro (2013) maintains that it is crucially important to get things off your chest instead of holding them inside. Deal with it in a timely and honest manner. If you deal with disagreements this way, they are usually resolved quickly and serve to build trust. There needs to be an established framework for this to take place. Members of the group also need to be cognizant that there are some things you just have to overlook. Choose your battles carefully.

Strive to be an inspiration to the group. Have open discussions about what inspires people. Focus and passion are infectious. There needs to be a culture of sharing that allows group members to think outside the box and feel safe to share with the group. Finally, remember to be yourself because nothing good comes from not being who we are meant to be. Everyone has strengths and weaknesses. Do not be afraid to share them because outstanding things happen when you do.

Increasing Instructional Capacity through Collaboration

If principals want to increase the instructional capacity in their schools, then they must give educators the time to collaborate. Jaquith (2013) studied two middle schools with different approaches to collaboration. The middle school with the most significant increase in instructional capacity utilized collaboration effectively. Cedar Bridge Middle School had Richard DuFour's four essential questions for collaboration posted in the library where the teams met to collaborate.

- What do we want students to learn?
- How will we know if students have learned it?
- What will we do if students don't learn?
- What will we do if they do?

These questions were the focus of the collaboration time. The principal also framed the teachers' goals for each collaborative planning session and participated which helped the teachers understand the importance of what they were doing. Teachers created common lesson plans based off their analysis of student work and implemented the strategies.

In order for instructional capacity to exist among teams, the right structures need to be in place. At Cedar Bridge Middle School, the teachers owned instruction, which was obvious from their common lesson plans created from analyzing student work. Administrators participated in the collaboration process with teachers and played an important role in the process. The principals at Cedar Bridge Middle School kept the faculty focused on the purpose of collaborative planning through constantly and consistently asking teachers to focus on certain groups of students and how to help them improve their learning (Jaquith, 2013). This allowed teachers to close the learning gaps of their students.

Administrators have to create the right conditions in order to build instructional capacity as well. These conditions need to allow teachers to learn from each other's expertise. At Cedar Bridge Middle School, it was common practice to bring student work and discuss it at collaborative meetings. This helped develop good learning practices among teachers as they met. Principals also provided feedback to the teams about their work, which helped teachers know how and want to achieve instructional capacity (Jaquith, 2013).

In order to build instructional capacity, principals have to communicate the right expectations. The principals at Cedar Bridge Middle School implemented conditions that created learning and teamwork by requiring teachers to collaborate about student work and create common lessons.

The administration also had to create teams that could work together to improve instruction and student learning. Principals should include knowledgeable staff on teacher teams and expand the direction of teachers' goals to include teachers from other grade levels who have the expertise needed to advance student learning. The teachers at Cedar Bridge Middle School were also expected to analyze student work and co-plan lessons and assessments based off their analyses. They used the information to modify their instructional practice as needed. This created a clear learning focus (Jaquith, 2013).

When creating a team, the members should have the expertise needed to make the team successful in achieving its purpose. The team members should be acknowledged among their colleagues for their expertise. Principals should know how to create, lead, and support instructional teams in order that instructional capacity is maximized and sustained (Jaquith, 2013).

Research has clearly demonstrated that teachers continue practicing what they have learned through professional development when collaboration is the norm. Teachers need time with one another to discuss student thinking and learning. Teachers report that the level of support from teachers is important because it makes whatever the goal you are working toward achieving, a school effort not a teacher effort. Teachers need continuing collaborative support if they are going to create effective changes in teaching and learning. Teachers need to be able to work together, to identify, and to agree on learning expectations of students, as well as to provide each other with structures that move students forward and enable them to take ownership of their learning. Ongoing collaboration is crucial in improving student achievement (Dyer, 2013).

When you are collaborating with colleagues, it is a good idea to give someone a clear leadership role. The group leader should be able to motivate the others to stay on topic and task which enables them to get the job accomplished. They should also be able to delegate the work evenly when the need arises so one person does not have to carry the weight of the entire load. The group should decide on clear goals in order for the group to stay focused. There also needs to be open communication and the willingness of all members to honestly discuss progress and address issues (Fernandez, 2012).

A study conducted by Pollak (2009), discovered that 84% of the teachers involved in the study preferred to participate in formal and informal collaboration to find best practices to use in their classrooms. The majority of the teachers who participated in the survey said they preferred peer collaboration over any other resource the district could provide. Those involved also said they would prefer to observe their colleagues teach a lesson, and the second choice was to attend professional development facilitated by a peer. The teachers were also more willing to teach a professional development to a group of their peers. In order for effective collaboration to take place, there should be a strong professional community, focused principal leadership, and teacher influence so that there can be improved student achievement through the process of building instructional capacity.

Collaborative Inquiry

Collaborative leadership can take on several forms; one of which is collaborative inquiry. Teachers in Oakland, California, applied to be a part of the Mills Teacher Scholars program. The program consists of more than ninety K-12 educators that increase their professional knowledge together through collaborative inquiry. Every new class presents itself with new difficulties, requiring teachers who participate start each year with an inquisitive mind. The teachers are not trying to repeat what they did the previous year. They continue to be open-minded when it comes to learning about their students and the best instructional strategies to teach them based upon an analysis of their needs (Cody, 2013).

Each year, teachers begin by creating a list of questions that will serve as their target for the future inquiries. The teachers decide how they will analyze data, observe one another teaching, look at student work, and listen to what their students have to say about their learning. Some of the inquiries that take place are based upon the information they received from students. When students are aware of the inquiries taking place, they can contribute to the process. During the course of one school year, a teacher, Mrs. Simmons, told her students she couldn't figure out why the students couldn't retain the information. One of the students suggested that Mrs. Simmons waited too long to give them a review over the material. She started doing random mixed reviews, and the students were able to retain the information and apply it better in new situations (Cody, 2013).

Teachers who are engaged in the inquiry process take ownership and see all group members as valuable leaders. The teachers who engage in this process become the experts at their schools. Mrs. Simmons maintained that teachers have a professional voice through this process. We do not just say we do not like something, or I do not want to do that. We have evidence that shows what we are doing is not working for our students, and it gives us more power. We also build trust and open communication across our school. Through this type of collaboration, you develop a better understanding of your students and begin to hold yourself accountable (Cody, 2013).

Palmisano (2012) maintained that collaborative inquiry gives educators a new role of creating professional knowledge by using their classrooms and schools as sites for research. Collaborative inquiry does not treat students as if there is a one-size-fits-all solution. Instead, there is a focus on investigating problems and questions that relate to student learning in the particular situation and the solution is modeled to the individual needs of the situation. There is a constant cycle of planning, action, and reflection that leads the learning experience. Educators look at the data produced from their instruction and decide how the data is going to impact their instruction. Teachers are no longer involved in passive learning that is produced by traditional professional development, but they are learning from the expertise of their colleagues through action and reflection. There have been several studies that prove the effectiveness of this approach to professional learning. Evidence has been uncovered that demonstrates a higher level of instructional practice, increased student achievement, and better organizational conditions through the collaborative inquiry process. Collaborative inquiry tends to serve diverse students better than the traditional approach to professional development, and teachers are more likely to accept ownership of what they have learned. When collaborative inquiry is practiced, individual and collective action are more focused, logical, and evidence based (Palmisano, 2012).

According to the Secretariat (2010), inquiry allows educators to refine planning, instruction, and assessment to become a better master of their craft. Inquiry is driven by a focus on student learning. Data from student work force teachers to investigate how their students learn. These investigations allow teachers to make informed decisions about what instructional decisions to make for their students.

There are seven characteristics of teacher inquiry. The first is relevant student learning guides inquiry. The main goal of teaching is to meet the diverse needs of the students in the classroom. The evidence teachers gather from student learning is vital if teachers are to discuss the best way students might learn a particular concept. The second characteristic is for teachers to be collaborative. This allows learners to be experienced at a deeper level. The collaborative process gives perspective and allows teachers to see student learning from different points of view. The third characteristic is for teachers to be reflective. Teachers must take time to reflect on students' participation and learning outcomes if they are going to meet the needs of their students. This reflection forces the group to build trust and tolerance of different perspectives. According to the fourth characteristic, inquiry grows from repeating cycles that develop valued student outcomes. The fifth characteristic is reasoned analysis that promotes deeper learning. Inductive reasoning is important during inquiry because educators can draw conclusions about student learning and alternative explanations for outcomes. Deductive reasoning is also important because educators can work together to clarify how learning should look. Adductive reasoning also takes place during inquiry. This is when teachers create and test a theory. Another characteristic of inquiry is being adaptive. Teachers should be willing to adapt their thinking, knowledge, and strategies to meet the needs of their students. The last characteristic is reciprocal, which means theory and practice firmly connect. It is vital that expert knowledge is used purposefully and strategically. Inquiry is influential due to the fact it is based on being flexible and practice-driven.

Collaboration and School Improvement

McClure (2008) found case studies that showed collaboration could take many forms and still improve student achievement. Sometimes teachers met in teams and compared student work to the standards, and discussed targets for instructional improvement in their classrooms. Teachers shared common planning time and used data to guide their instructional decisions, and the coach or lead teacher met with them. In some schools teachers created teams to plan their professional development and to make sure lessons were aligned across the grade levels.

In December 2011, Wimberley conducted a research study on teacher collaboration and student achievement. Wimberley (2011) found that student achievement in Mathematics and Reading increased in schools where teachers collaborated during the contractual day and involved structured strategies and goal setting. The length of time schools had been effectively collaborating also played a crucial role in the process for improving student achievement. The schools that were most successful created SMART goals. Common assessments were also utilized in schools that collaborated. Collegiality was greater in schools that collaborated, which improved the atmosphere or climate within the school, as well as the entire district. There was a Mean Difference of 10.91 among students scoring in the proficient and advanced levels between collaborative and non-collaborative schools in Reading and a Mean Difference of 12.71 in Mathematics.

Affects of Collaboration on Low-Income Schools

McClure (2008) maintained that a 2008 practice guide from the U.S. Department of Education found that collaboration was used often to improve instruction in low-performing schools within a period of three full school years. Case studies illustrated that different collaboration methods were utilized in the schools. The collaboration teams in some of the schools met to compare student work against the standards in order to select goals for instructional improvement. Other schools shared planning time, analyzed data to drive instructional decisions, and obtained support from a coach or other instructional leader. Still others met to plan their own professional development and to align lessons across each grade level.

Research by Chenoweth and Theokas (2013) discovered that high-performing schools located in low-income communities had effective school leaders that believed in the process of collaboration. These principals made sure that teachers had time to collaborate during the school day which they used effectively to discuss and influence instructional strategies. The principal usually attended these meetings, which emphasized the importance of the collaborative process, as well as the maximization of student achievement. Teachers shared their expertise because no individual person has all the answers. One principal in the study used multiple sources of data to determine what the teachers' needs were and planned professional developments based on the needs of the faculty members. Successful leaders use evidence to determine what works and what does not in order to continue moving teachers and students forward.

Making changes to instructional practice is the key to improving student learning in urban schools and other underachieving schools. Hollins (2006) strongly suggested that to really improve teaching, schools in urban areas need to change from a culture that places the responsibility of learning barriers on students to a culture that insists teachers take responsibility as a group for ensuring that students learning is maximized. An abundant amount of literature suggests that using learning communities and teacher collaboration to promote professional development leads to the transformation of the culture in a school to the belief that the responsibility for learning belongs to teachers and it is the responsibility of the collective group of professionals in the building for ensuring that all students learn at the highest levels possible.

According to Hollins (2006) the Urban Literacy Institute worked with three urban schools in Ohio to help them develop a collaborative culture in an effort to improve the literacy instruction for their students. Teachers met in school-based teams so that they could have structured conversations about their teaching. The teachers' practice developed into greater collaboration, which enabled them to seek help they would not have had previously (Hollins, 2006).

The focus of each meeting was the improvement in student literacy. These discussions lead to teachers taking the responsibility for student learning at their schools and for them developing positive attitudes toward mandates and policies that sometimes interfere with their work. Teachers also began to develop a systematic approach to problems and challenges they face each day.

The culture, which most schools had before they began collaborating, consisted of those that included beliefs that kept them from improving instruction for their urban students. During the cultural transition, most of the teachers accepted the relationship between instructional practices and learning outcomes. Teachers began to take more responsibility for student learning and for the professional growth of their colleagues. Teachers also started to regularly discuss the connections between what constituted quality instruction, a student's experiences, as well as what were the results of learning. They also began taking responsibility for each student learning as well as the successes and the learning of their peers (Hollins, 2006).

The teachers that did not abandon the project experienced improved student growth on state mandated tests. Some schools demonstrated great improvement while others only showed some improvement. One school did not experience very much growth, which was attributed to the amount of time they spent helping two struggling teachers. Structured collaborative dialogue seems to be an encouraging professional practice for educators in urban districts (Hollins, 2006).

Data-Driven Instruction

Often, teachers think formative assessment data that drives instruction need to be lengthy and complicated but in reality it can be something as simple as an exit card. According to Doubet (2011), an exit card assessment can be given the last 5-10 minutes of class to determine who has a working understanding of the standard and who is ready to move on to the next step in learning. When the teacher has this valuable information, she is ready to use it to drive instruction. Lessons can be created to address the individual needs of the students such as correcting misconceptions, closing gaps in understanding, and to expand knowledge. This data is essential in aiding the teacher in improving student achievement.

There are five guidelines to follow when collecting and analyzing data (Moore, 2014). The first guideline is that if you are not going to utilize the data, why bother to collect it. Data should also be easy to use, and should come from many sources. The data used should be benchmarked or have comparison groups. The final guideline is to remember to respond to the data and not to react or overreact to it. The measures used to obtain data on student performance should be evaluated through four lenses: formative, summative, qualitative, and value-added.

Teachers need to remember that assessments are only formative when they are informative and allow the teacher to adjust their strategies. Formative assessments can be thumbs up, response cards, exit cards, and clicker type questions. This type of data should be collected daily, weekly, monthly, and quarterly if it is going to improve student learning. Teachers should work with their colleagues to identify standards and skills for developing rigorous questions in order to improve their instruction. It is vital for teachers, schools, and districts to set timelines for giving formative assessments (Moore, 2014). Summative assessments are also important because they encompass state tests and end-of-course exams. Using this data can help determine instructional quality and the effectiveness of programs.

Moore (2014) also maintains that qualitative data are important even though they are not collected very often. Qualitative data can be an effective tool in implementing school improvement. It is important to know the perceptions of internal and external stakeholders. Giving team surveys is a great way to find out how well teams work together, and can be used to provide professional development to improve teamwork. Teacher surveys help school leaders improve their practice and make better decisions for the school. Stakeholder surveys allow the school and district to learn about outside perspectives and allow improvements to be made.

Value-added data is used to estimate the impact that districts, schools, and teachers have on the academic growth of their students. It also provides a broader picture by placing students into groups based upon such factors as economic status, parents' education, and other categories that can hinder student learning. Value-added data allow teacher strengths to be identified and students to be matched to those teacher strengths, especially for intervention groups. Value-added date also allows for a teachers' areas of refinement to be identified (Moore, 2014).

According to the National Association of Elementary School Principals (2011), teachers need to use data to drive instruction and meet students' learning needs by following a systematic and routine process. Teachers need to collaborate throughout the process in order to expand the benefits of using data by sharing proven practices, establishing common expectations for students, developing a deep knowledge of student needs, and obtaining more effective teaching strategies. To really understand the learning needs of the students, educators need to collect and analyze data from several sources. Based on the information provided by National Association of Elementary School Principals (NAESP, 2011), students need to be involved in reviewing their own data and setting learning goals. Teachers need to explain their expectations and how students will be assessed and provide feedback based off the assessments. Student data should be used to develop necessary instructional changes that allow students to continue to grow academically. Data and collaboration must be part of the continuing cycle of instructional improvement in order for the instructional program to be effective.

According to Darnell (2014), students want to have their learning goals clearly communicated to them. Assessment-literate teachers align instruction to the goals and how they will assess students. Students also want to be assessed in multiple ways that have real-life applications. Assessment-literate teachers vary how they assess what students have learned enabling the teacher and student to develop a clear picture of what students understand. Students need feedback about what they have learned so they can make adjustments to their learning. Students also want teachers to analyze the test results in order to understand their strengths and weaknesses, show adequate improvement, and to redo assessments if necessary. Students depend upon teachers to ascertain the major reasons for their low performance and develop and refine methods for helping them improve and the best ways for them to improve. Assessment-literate teachers are constantly analyzing data to improve student achievement.

Since accountability in education has increased, almost all school principals have begun using data to drive instruction in the classroom (Fenton and Murphy, 2014). Principals in schools that are improving at rapid rates indicate that data-driven instruction was one of the most influential factors in realizing the improvement. Improving instruction will not happen at high rates without analyzing data and using it to increase student achievement. Fenton and Murphy (2014) maintained that in order to get every child in high school, college and career ready, every teacher needs to be focused on the same standards and assessments in every grade level. All texts need to be aligned precisely to the standards and should reflect the same rigor as the state assessment. Test data become more relevant when assessments are aligned to the standards, and instruction can be targeted at helping students master the standards. When educators analyze test data, they should focus on individual test questions so instruction can be more meaningful. Analyzing data is very important but it is not worthwhile without productive action. Using data is essential for improving student achievement.

Another excellent source of data to drive instruction are pre-assessments which are valuable tools only when implemented and used effectively. Beneficial pre-assessments allow teachers to create lessons that differentiate for readiness. Pre-assessments should be designed to inform the teacher about what the student knows and is ready to learn. A pre-assessment is considered useless if it does not let the teacher know what and how students are thinking, what they know, and what they need to know. Teachers should also consider what students should already know and be able to do before beginning the unit. Pre-assessments should be designed to measure student understanding instead of knowledge and ability (Hocket & Doubet, 2014). Hocket and Doubet (2014) cited a case in which a teacher did not use pre-assessments effectively, so she stopped using them until the following year when her professional learning community's goal was to create effective pre-assessments. While the teacher worked with her colleagues, she redesigned her pre-assessments to clearly focus on the outcomes in terms of important knowledge, skills, and conceptual knowledge. When the students took the pre-assessment the data was more valuable, and the teacher was able to use it to drive her instruction. Pre-assessments can aid a teacher by bringing potential problem areas to the forefront, thereby enabling the teacher to redesign the student lessons, which meet the needs of the students through differentiation. Teachers have to remain cognizant of readiness changes based on instruction, so placing students in permanent groups based upon the pre-assessment data is not recommended. Teachers need to constantly check to see where the students are, what they know, what they have learned, and what support they need to be successful. Pre-assessments are just one tool for data-driven instruction (Hocket & Doubet, 2014).

There are two types of data-driven instruction. The first type of data-driven instruction is the school level and the second is the classroom level. At the school level, the faculty and staff look at all the data so they can understand the state of the school, how they got to this point, determine if the school is meeting its targets, know the true reasons for the gaps, and evaluate what is being successful or not. The classroom data is the information collected about the effectiveness of teaching strategies, such as common assessments throughout the year (Bernhardt, 2009).

In order for schools to be effective, educators need to use many forms of assessments. Not only should teachers assess student learning, they should use the results of the tests to make instructional decisions. Teachers should collaborate in the development of pre-assessments, as well as formative and summative assessments. Teacher developed pre-assessments allow educators to gather data to differentiate instruction and clear up misconceptions their students have about concepts. Formative assessments give teachers checkpoints to determine if they need to change their instruction. Summative assessments help educators make decisions about their instructional effectiveness and decide if they need to reteach or change what they are teaching (Cummings, 2014).

Building Data-Driven Instruction

Data is not a powerful tool until its user can precisely understand it and put it into action to improve student achievement (Siedlecki, 2012). Siedlecki (2012) suggests that there are five building blocks that need to be in place so that data can be used effectively. The first building block is that principals and other leaders must to be committed in order that the appropriate cultures in their schools can be created and sustained. This means that administrators cannot merely support data-driven instruction, but they must also participate in the discussions and the decisions made from it. When this takes place, schools will see significant student achievement gains.

The second building block according to Siedlecki (2012) is that teachers and principals require data be collected from a variety of sources in order that meaningful data-driven instruction can occur. The teaching professionals cannot have meaningful data from multiple sources if they have a narrow view of test data. Data should include test scores. However, data should also include formative assessments, student engagement, and student work of all kinds. Data cannot come from only one source or one type of assessment.

According to Siedlecki (2012), the third building block is the integration of data tools into the classroom so that teachers are able to analyze the enormous amount of data they collect on a daily basis. Principals need to remember that there is not one single assessment tool that solves every problem. Those data collection tools that incorporate numerous types of computer assisted, as well as the teacher-generated data are the most beneficial and reliable.

The fourth building block, according to Siedlecki (2012), is making sure that teachers have the necessary training they require to be able to effectively analyze and use the data provided. Schools cannot afford to have teachers in possession of critical student data without the ability and the necessary training and professional development to be able to analyze the data and to be able to use all the data available for the improvement of student achievement. Real efforts need to be made to assist teachers in the understanding of the test data. Schools should have a plethora of teacher support options available, such as professional development or qualified and highly trained instructional coaches to help enhance teacher data analysis skills.

The last building block mentioned by Siedlecki (2012) is to have a system in place that ensures that data-driven skills and instruction are implemented as part of the daily process in the classroom. Siedlecki firmly believes that this is where most schools fall short. The view of data-driven instruction is one of not being a vital part of teaching and learning. Principals cannot assume that teachers will use the student data in their instructional planning process. They have to ensure that they do use the student data through the development and implementation of specific administrative structures through which the leadership of the school and the teacher teams discuss data, allows for blocks of time to plan strategies and analyze the data, provides time to discuss the data and how the information should be used to change teaching strategies, and time to react to the data in the classroom. According to Siedlecki (2012), when you have all of these components in place, you have the framework for making sure that data-driven instruction can and will occur and flourish in a school.

Accurate and pertinent data can help pinpoint areas of major and minor concern, demonstrate that students are actually learning and what they are learning, and help in the development of strategies and answers to the concerns. Sharing of data is very important between collaboration team members. This provides an avenue where they can share what they have learned as a result of the data. This level of trust takes time to develop but is key to improving student learning (The Center for Comprehensive School Reform and Improvement, 2010).

Requirements of Data-Driven Instruction

Research has provided ample proof that data-driven instruction improves student achievement, but there are requirements for it to be effective in improving student achievement. Schools need to have baseline data on all their students. They need to have a working knowledge of where their students are at the beginning of the school year in order to have a place from which to begin the forward movement. There should be clear targets that explain what students are expected to master by the end of the school year and what is considered mastery. Throughout the school year, there needs to be a variety of assessments that provide evidence of student mastery toward the targeted expectations. Instruction should be focused and planned based on the evidence from student data. Teachers need to have a clear understanding of what students know and what they do not know (Thompson, 2010).

Thompson (2010) outlines the process for effective data-driven instruction. According to Thompson (2010), the first step in the process should be that educators should focus on areas where students are having their greatest learning difficulties. By sorting standards and skills into categories of strengths, challenges, and critical needs, teachers can pinpoint where to start with the instruction for each student. The next step required of the teachers should be that they target specific needs of students by completing an item analysis of the skills and concepts. Finally, the last step in Thompson's process is to plan classroom instruction that will move students towards the mastery of the identified skills and concepts. When teachers follow this process and these procedures, they will quickly realize a significant increase in the level of student achievement in their classroom and the school as a whole.

Using Student Data

McLeod (2005) insisted that using student data to make decisions, requires teachers to shift their method of thinking from day-to-day instruction that focuses on process and delivery to one that is essentially centered on the achievement of student results. McLeod (2005) further maintains that most teachers are not properly equipped or trained to immediately begin using data-driven approaches to guide instructional practices in the classroom. Teachers who want to use data-driven methods and are dedicated to effectively implementing the process, need to know the main parts of effective data-driven instruction. According to McLeod (2005), the main parts of effective data-driven instruction include, the collection of good baseline data, the development of measurable instructional goals, the use of frequent formative assessment, a commitment to the Professional Learning Community (PLC) concept, and the belief in and a commitment to the use of focused instructional interventions. Teachers who are truly data-driven understand the importance of using many measures and indicators when analyzing school and student success. Teachers need multiple forms of data to create appropriate interventions for their students because one test cannot provide a teacher with an accurate measure of student learning.

Alber (2011) outlined three ways by which teachers should use student test data to inform and improve classroom teaching. Alber provided several good examples of how student data can inform a teacher's instruction. The primary example provided by Alber came straight from an actual classroom instruction. Teachers give formative assessments daily and can use this data to make decisions about instruction and the teaching-learning process. Formative assessments can be exit slips, short quizzes, as well as many other means of whole class responses. It does not have to be long and complicated. Teachers can use data from observations as well. By simply walking around the classroom and watching students work, a teacher can gather important data that will provide the teacher with the data to make immediate alterations to the teaching process such as to adjust pacing or the use of scaffolding when it is apparent that it is needed based upon what is observed as the primary needs of the students. Summative assessments give important information as well. Teachers can use this data to determine how successful their teaching was and where they need to make important changes in the future.

Alber (2011) also insisted that cumulative files have valuable information that can help teachers determine causes for student behavior and learning difficulties. When teachers have access to this kind of information, they can better meet the needs of individual students. Having data which makes the teacher more knowledgeable of student needs based upon data collected over the years by other professionals is a valuable tool. Possessing such important information about a student can help build a relationship with that student and set learning goals with their input. Teachers can also provide necessary empathy when it is needed as well as acknowledge a students' documented hardships, which is crucial in helping to build relationships.

Standardized tests along with other data can help teachers make decisions about instruction. Alber (2011) provides a number of suggestions for utilizing standardized test data for such areas as: developing classroom seating arrangements, differentiating instruction, pacing or scaffolding of lessons, and determining why high performing students score low on standardized tests. Once teachers have the appropriate data, then they can begin helping their students reach their potential.

According to Protheroe (2009), there is sufficient evidence that data can improve instruction when the data is high quality, targeted, and used by trained staff. Protheroe found evidence that schools that were successful in closing the gap were more likely to use data for diagnostic reasons and to more thoroughly analyze the data. Four school districts that greatly increased student performance on state tests aligned their instruction with test questions, created a detailed analysis of student responses, and gave timely and appropriate instruction to rectify any misconceptions by students based upon the analyses. The four districts began improvements by discussing test data carefully. Schools that continue to improve, regularly and systematically use student performance data to determine where they are successful and where they need to improve. Principals are also actively involved in the collaborative process and discussions aimed at improving student achievement.

Teachers need good data to be able to disaggregate it by school, classroom, and specific students. The data should also give a precise analysis by standard or skill plus overall scores. As has been proposed previously, the importance of using classroom data in addition to all of the standardized test data is emphasized. Assessment is an every day occurrence. Before teachers can use data effectively, everything that is done in the classroom should be aligned with the state standards and state assessment. Once this has been accomplished, teachers can improve teaching strategies based entirely upon the student assessment data collected and can differentiate instruction as needed or required (Protheroe, 2009).

Data systems are an important part of collecting, analyzing, and using data. Universal screening systems can be used at the beginning and the middle of the school year to pinpoint which students are tracking for success and which students are essentially considered to be at-risk. At-risk students can be given the proper research-based interventions in order to help them achieve. Schools are then responsible for the monitoring of these students to ascertain their progress, as well as to determine if the interventions are working. Schools should also use formative assessments to measure student growth and to determine if adjustments need to be made to enhance instruction (Center on Instruction, 2010).

Once classroom teachers have access to baseline tests, such as state assessments, they should work with their administration to determine what success is going to look like in their classrooms. Teachers need to be willing to give honest feedback to building and district administrators concerning the helpfulness of the data received. The role of the principal is to provide classroom teachers with precise, timely, and easily understood data. Building administrators need to be willing to help teachers identify the needs of the students in their classrooms and to intervene on the behalf of all students. Teachers need to be willing and ready to make changes when appropriate and when the test data analyses demonstrate that the changes are warranted (McLeod, 2005).

According to McLeod (2005), teachers also need to have a system in place to administer formative assessments, so they can adjust instruction based on the needs of their students. Research has clearly demonstrated that good formative assessments have a larger impact on student learning and closing achievement gaps than all other instructional practices. In order for teachers to fully grasp the impact formative assessments have on learning, they need to collaborate often about student data-based progress. Teachers should discuss patterns, misconceptions, and student progress in reaching year-end goals. Then educators are able to implement interventions that will enable them to improve student learning. Collaboration has shown to have dramatic impacts on student learning and teacher satisfaction.

There are in existence a plethora of case studies and interviews that suggest that using test data can have a positive impact on the people involved in the educational process by creating a more professional culture. Research has highlighted that collaboration increased as educators studied the data and were required to make decisions based on the data. School leaders involved in data analyses discovered that they became in charge of their own futures and were able to increase student achievement through their active involvement in the collaborative process. Collaboration and the employment of student data were significant contributors in the process of improving the attitudes of those involved. As a result, the teachers involved usually started to seek professional advice of others and also were more likely to seek professional development opportunities designed to improve their skills. Using data also helped change their attitudes about low-performing groups and caused them to develop higher expectations for these students (Wayman, 2005).

In order for data to be used effectively, there needs to be several conditions present that lead to success. These conditions are broken down into three categories. First, teachers need to have access to high quality student test data such as multiple measures. Additionally, student data need to be well organized, easy to understand, and relatively easy to analyze. Finally, the student data need to be accurate, timely, and disaggregated. Without access to quality data, educators can become frustrated. There is too often a tendency for educators, out of frustration and a lack of quality data, to misinterpret and by interpreting the data incorrectly, they can actually be more harmful than beneficial (Ronka, Geier, & Marciniak, 2010). The next category for data use is data capacity. Teachers must have the capacity to obtain, understand, and use the data; otherwise, it is pointless to have the data. Data capacity is the organizational component that includes team structures, collaborative norms, and defined roles and responsibilities associated with the data. It also includes technology, data accessibility, and assessment literacy skills. To have strong data capacity, principals need to ensure that all faculty members have been well trained in the use and analysis of data. The final category is data culture. A strong data culture is one where teachers and staff constantly collaborate on data and its use. It includes strong commitment, a clear vision and beliefs about the value of data and teaching, and accountability. Teachers are constantly improving instruction and programs to increase student achievement (Ronka, Geier, & Marciniak, 2010).

For data-driven collaboration to be effective, teachers have to be willing to make instructional changes that are meaningful. Teachers have to be willing to collaborate to apply strategic interventions to improve student outcomes. Interventions must be aligned to state standards, district curricula, and instructional best practices. Teachers must let go of the mentality that students and families have the greatest impact on student learning and come to the conclusion that collectively they possess the greatest power over student learning outcomes (McLeod, 2005).

McLeod (2005) insisted that results-driven teachers are constantly evaluating their instructional practices to determine the impact of the instructional practices on student outcomes. Any practice or program that interferes with student learning is reexamined and modified. Successful teachers also evaluate practices that are working to see if they can be improved. This is because they understand that even minuscule improvements add up over the course of time. It is best to set short-term goals in order to see the results quicker to remain motivated. It is extremely important for administrators and teachers to collaboratively plan professional development trainings that align to school needs.

Conclusion

Based upon the information presented, data-driven collaboration is vital to improving student achievement and closing the gaps among sup-groups. School and district leaders need to play a vital role in collaboration and participate in analyzing the data so that teachers are encouraged, through their example, and are completely committed to the use of data-driven collaboration. Educators need to be trained in the skills necessary to use data and collaborate effectively in order to have a positive impact on student learning. Teachers need to build relationships within their teams in order to develop and maintain trust and collegiality if they are going to be able to work together to meet the diverse needs of the students in their classrooms. Teachers need to embrace the fact that they have the greatest impact on student learning.

CHAPTER III

METHODOLOGY

Introduction

The purpose of this study was to explore the impact of data-driven collaboration on student academic achievement of students in tested subgroups in the content areas of Reading and Mathematics. The independent variables are data-driven collaboration, gender, ethnicity, socio-economic status, and the dependent variables are Mathematics and Reading based on Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores data and interviews of academic coaches to determine the frequency and extent of the data-driven collaboration and its impact on student learning in each school in the fourth, fifth, seventh, and eighth grades.

Research Design

This was a mixed methods study, which includes quantitative and qualitative data. This study provided averages and distributions of data as well as descriptive data based on Mathematics and Reading Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) score data from the 2012-2013 and 2013-2014 school years and interviews with academic coaches. The researcher used a non-experimental, causal-comparative research design. Archival data along with data collected from interviews was used to determine the impact of data-driven collaboration on the academic achievement of the following subgroups: male, female, majority, minority, non-economically disadvantaged and economically disadvantaged students in Mathematics and Reading. A Two-Tailed *t*-Test was conducted to determine whether there was a statistically significant difference for each subgroup among the schools' Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores in Mathematics and Reading for the 2012-2013 and 2013-2014 school years. The Two-Tailed *t*-Tests also determined whether or not the Null Hypotheses should be retained or rejected.

Population

The population for this study consisted of fourth, fifth, seventh and eighth grade students in one school district selected from schools that have used data-driven instruction more than three years and from schools that had used data-driven instruction less than three years. Two elementary and two middle schools were chosen to participate in this study based on the length of time they had implemented data-driven instruction. One elementary and one middle school had been practicing data-driven collaboration less than three years; one elementary and one middle school had been practicing data-driven collaboration more than three years.

The population at each elementary and middle school varies with regards to socio-economic status, ethnicity, gender, and mobility of students, which could play a role in the effectiveness of data-driven instruction on student learning. The four schools were divided and matched based on the duration of data-driven collaboration and grade levels. Schools that implemented data-driven instruction for more than three years were compared to the same grade levels of schools that implemented data-driven instruction three years or less. The sample for each grade level is appropriate for generalizing the population because the sample is located in the same district as the population.

Instrument

The instrument that was utilized in this study to gather standardized test data in Reading and Mathematics was the Tennessee Comprehensive Assessment Program (TCAP) test. The TCAP is an annual assessment administered to students in grades third through eighth throughout the state of Tennessee, and particularly, in the school district where the study was conducted. This assessment utilized selected-response questions in Reading and Mathematics to measure students' knowledge and application of standards taught throughout the school year. Each of the items on the assessment were criterion-referenced and aligned with the state content standards. The purpose of the test was to provide summative data on individual student academic achievement and growth. The data was recorded for individual students at the state level and contained results on academic achievement and growth for Reading and Mathematics, as well as Science and Social Studies.

Interviews were also conducted to determine the extent and length of data-driven collaboration at the schools participating in the study. Academic coaches responded to the survey questions, and the responses were used to determine the level of data-driven collaboration at each school. The data from the surveys were then used for making appropriate comparisons between the schools in the study using the test data collected from the Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores from the 2012-2013 school year and from the 2013-2014 school year to determine if data-driven collaboration had an impact on student achievement among various subgroups.

Procedures

The data used for this study were collected from the school district's Accountability Coordinator. This particular individual provided the data requested by the researcher with the purpose of matching the subgroups within the chosen schools as accurately as possible. The data were gathered and presented to the researcher in a codified format to maintain complete anonymity of all participants. The data were disaggregated according to the length and extent of data-driven collaboration at each school. Data was divided into the following categories for each school: male, female, majority, minority, non-economically disadvantaged, and economically disadvantaged students. Each student's 2014 Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) data was subtracted from his or her 2013 Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) data to determine if there was an increase or decrease in achievement.

After each school's data were collected, the appropriate schools were matched together and labeled by category so the data could be analyzed. The elementary school that had been using data-driven collaboration more than three years was matched to the elementary school that had been using data-driven collaboration for less than three years. The middle school that had been using data-driven collaboration more than three years was matched to the middle school that had been using data-driven collaboration for less than three years. Data was also disaggregated by gender, ethnicity, and socio-economic status. After each school was matched and the data disaggregated, tables were created for each school so the data could be analyzed. The appropriate data was placed in each table to compare the effects of data-driven collaboration on student learning between the subgroups.

The researcher utilized the data displayed in both tables to generate separate Two-Tailed *t*-Tests. The Two-Tailed *t*-Tests were conducted to determine whether or not there was a statistical significance on the overall Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores in Reading and Mathematics for each subgroup. There were twenty-four Two-Tailed *t*-Tests performed to compare and analyze the data of the schools that have used data-driven collaboration for more than three years and schools that have used data-driven collaboration for three years or less. Data from the 2012-2013 school years and from the 2013-2014 school year were gathered and analyzed for this study. The results of the Two-Tailed *t*-Tests are reported in Chapter Four of this field study.

Before interviews of the academic coaches were organized, the researcher obtained permission from the Director of Instruction and Curriculum and the principals at each school chosen for the study to conduct the interviews. Then the academic coaches were contacted to determine if each was willing to participate. After each academic coach agreed to be interviewed, a time and venue were established. The researcher emailed the principals and academic coaches the list of interview questions, so any data could be collected if necessary. The interviews were conducted, and the information was recorded during the interview by the researcher. The responses were disaggregated by question and compared to the Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) data from each school to determine if there was a correlation between data-driven collaboration and student achievement.

Null Hypotheses

1. There will be no statistically significant difference in Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores between the school years of 2013 and 2014 of majority students in schools that have practiced data-driven collaboration more than three years as compared to Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores of students in majority groups in schools that have practiced data-driven collaboration less than three years.
2. There will be no statistically significant difference in Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores between the school years of 2013 and 2014 of minority students in schools that have practiced data-driven collaboration more than three years as compared to Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores of students in minority groups in schools that have practiced data-driven collaboration less than three years.
3. There will be no statistically significant difference in Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores between the school years of 2013 and 2014 of female students in schools that have practiced data-driven collaboration more than three years as compared to Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores of female students in schools that have practiced data-driven collaboration less than three years.

4. There will be no statistically significant difference in Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores between the school years of 2013 and 2014 of male students in schools that have practice data-driven collaboration more than three years as compared to Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores of male students in schools that have practiced data-driven collaboration less than three years.
5. There will be no statistically significant difference in Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores between the school years of 2013 and 2014 of economically disadvantaged students in schools that have practiced data-driven collaborative more than three years as compared to Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores of economically disadvantaged students in schools that have practiced data-driven collaboration less than three years.
6. There will be no statistically significant difference in Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores between the school years of 2013 and 2014 of non-economically disadvantaged students in schools that have practiced data-driven collaborative more than three years as compared to the Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores of non-economically disadvantaged students in schools that have practiced data-driven collaboration less than three years.

7. There will be no statistically significant difference in Mathematics Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores between the school years of 2013 and 2104 of students in schools utilizing data-driven collaborative practices more than three years as compared to the Mathematics Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores of students in schools that practiced data-driven collaboration less than three years.
8. There will be no statistically significant difference in Reading Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores between the school years of 2013 and 2014 of students in schools utilizing data-driven collaborative practices more than three years as compared to the Reading Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores of students in schools that practiced data-driven collaboration less than three years.

Data Analysis Plan

The Two-Tailed *t*-Tests were utilized to compare the differences in the Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores from the 2012-2013 school year and the 2013-2014 school year of male, female, majority, minority, non-economically disadvantaged, and economically disadvantaged students from the fourth, fifth, seventh, and eighth grades. The Two-Tailed *t*-Tests were administered to determine if there was a statistical significance in Tennessee

Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores for Reading and Mathematics on the state sponsored assessments.

The researcher compared the Normal Curve Equivalency (NCE) gain scores to determine if they were statistically significant. The differences between the 2013 and 2014 Reading and Mathematics Normal Curve Equivalency (NCE) gain scores on the Tennessee Comprehensive Achievement Program (TCAP) were compared for the different subgroups among the schools selected to participate in the study to determine if data-driven collaboration had an effect on student learning. The researcher analyzed the data to determine whether or not there was a significant statistical difference between the Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) gain scores of students in the sample.

The researcher also compared the data from the interviews of the academic coaches from each school to determine the extent of data-driven collaboration and to determine if there is a correlation between the Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency (NCE) scores and the extent of data-driven collaboration. Depending on the findings, the researcher either rejected or retained each Null Hypothesis.

CHAPTER IV

RESULTS

Introduction

This study was conducted to determine if the length of time a school has utilized data-driven instruction has any effect on student achievement. Two elementary schools were selected for this study. One elementary school had practiced data-driven instruction less than three years and one elementary school had practiced more than three years. Two middle schools also participated in the student with the same criteria as the elementary schools. The number of participants varied based on the subgroup being compared.

Analysis of Findings

The researcher used JMP software to analyze the data by creating a spreadsheet to calculate a Two-Tailed *t*-Test at the Alpha level, $\alpha = .05$, to test each hypothesis.

Null Hypothesis 1

There will be no statistically significant difference in Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency NCE scores between the years of 2013 and 2014 of majority students in schools that have practiced data-driven collaboration more than three years as compared to TCAP NCE scores of students in majority groups in schools that have practiced data-driven collaboration less than three years.

The researcher utilized the participants in the majority group's fourth and fifth grade Mathematics Normal Curve Equivalency (NCE) gain scores from the 2012-2013 school year and the 2013-2014 school year from Elementary School 1, which had practiced data-driven collaboration less than three years and Elementary School 2, which has practiced data-driven collaboration more than three years. The Mean for the majority group from Elementary School 1 was -0.50 with a Standard Deviation of 13.09 (see Table 1).

TABLE 1

Two-tailed t-Test at the a = .05 Level Evaluating Majority Students Mathematics Normal Curve Equivalency (NCE) Gains Comparing Elementary School 1, Which has Used Data-Driven Collaboration Less than Three Years, and Elementary School 2, Which has Used Data-Driven Collaboration More than Three Years

Elementary School	**Participants**	**Mean**	**Standard Deviation**	***p*-Value**
1	105	-0.50	13.09	
				0.49
2	110	-0.56	14.10	

*** Significant at *p* <.05**

The Mean for the majority group from Elementary School 2 was -0.56 with a Standard Deviation of 14.10. The researcher used a Two-Tailed *t*-Test that was tested at the Alpha level, $\alpha = .05$, to determine if the length of time of data-driven instruction influences majority students achievement. The Two-Tailed *t*-Test yielded at $p = 0.49$. The results led the researcher to retain Null Hypothesis 1 for evaluating majority students Mathematics Normal Curve Equivalency (NCE) gains comparing elementary school 1, which has used data-driven collaboration less than three years, and elementary school 2, which has used data-driven collaboration more than three years. (TABLE 1 illustrates the results of the Two-Tailed t-Test)

The researcher utilized the participants in the majority group's fourth and fifth grade Reading Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Elementary School 1, which has practiced data-driven collaboration less than three years and Elementary School 2, which has practiced data-driven collaboration more than three years. The Mean for the majority group from Elementary School 1 was 1.62 with a Standard Deviation of 13.59. The Mean for the majority group from Elementary School 2 was 0.38 with a Standard Deviation of 11.62. (See TABLE 2 for the Mean scores)

TABLE 2

Two-Tailed t-Test at the a = .05 Level Evaluating Majority Students Reading Normal Curve Equivalency (NCE) Gains Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration More than Three Years

Elementary School	**Participants**	**Mean**	**Standard Deviation**	***p*-Value**
1	105	1.62	13.59	
				0.24
2	110	0.38	11.62	

***Significant at *p* < .05**

The researcher used a Two-Tailed *t*-Test that was tested at the Alpha level, $\alpha = .05$, to determine if the length of time of data-driven instruction influences majority students achievement. The Two-Tailed *t*-Test yielded an Alpha of $p = 0.24$. The results led the researcher to retain the Null Hypothesis for evaluating majority students Reading Normal Curve Equivalency (NCE) gains comparing Elementary School 1, which has used data-driven collaboration less than three years, and Elementary School 2, which has used data-driven collaboration more than three years. (TABLE 2 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

The researcher utilized the participants in the majority group's seventh and eighth grade Mathematics Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Middle School 1, which has practiced data-driven collaboration less than three years and Middle School 2, which has practiced data-driven collaboration more than three years. The Mean for the majority group from Middle School 1 was 2.29 with a Standard Deviation of 12.09. The Mean for the majority group from Middle School 2 was -1.05 with a Standard Deviation of 13.00. The researcher used a Two-Tailed *t*-Test that was tested at the Alpha level, $\alpha = .05$, to determine if the length of time of data-driven instruction influenced majority students achievement. The Two-Tailed *t*-Test yielded at $p = 0.01$. The results led the researcher to reject the Null Hypothesis for evaluating majority students Mathematics Normal Curve Equivalency (NCE) gains comparing Middle School 1, which has used data-driven collaboration less than three years, and Middle School 2, which has used data-driven collaboration more than three years. (TABLE 3 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

TABLE 3

Two-Tailed t-Test at the Alpha a = .05 Level Evaluating Majority Students Mathematics Normal Curve Equivalency (NCE) Gains Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	Participants	Mean	Standard Deviation	*p*-Value
1	213	2.29	12.09	
				0.01*
2	162	-1.05	13.00	

***Significant at $p < 0.05$**

The researcher utilized the participants in the majority group's seventh and eighth grade Reading Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Middle School 1, which has practiced data-driven collaboration less than three years and Middle School 2, which has practiced data-driven collaboration for more than three years. The Mean for the majority group from Middle School 1 was -1.47 with a Standard Deviation of 12.20. The Mean for the majority group from Middle School 2 was -0.45 with a Standard Deviation of 12.57.

The researcher used a Two-Tailed *t*-Test that was tested at the Alpha level, α = .05, to determine if the length of time of data-driven instruction influences majority students achievement. The Two-Tailed *t*-Test yielded at $p = 0.78$. The results led the researcher to retain the Null Hypothesis for evaluating majority students Reading Normal Curve Equivalency (NCE) gains comparing Middle School 1, which has used data-driven collaboration less than three years, and Middle School 2, which has used data-driven collaboration more than three years. (TABLE 4 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

Table 4

Two-Tailed t-Test at the a = .05 Level Evaluating Majority Students Reading Normal Curve Equivalency (NCE) Gains Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration More than Three Years

Middle School	**Participants**	**Mean**	**Standard Deviation**	**p-Value**
1	213	-1.47	12.20	0.78
2	162	-0.45	12.57	

***Significant at $p < .05$**

There was not a statistically significant difference among majority students' Mathematics and Reading Normal Curve Equivalency (NCE) gain scores between Elementary School 1 and Elementary School 2. However, the results indicated that a statistically significant difference existed among majority students' Mathematics Normal Curve Equivalency (NCE) gain sores between Middle School 1 and Middle School 2 with Middle School 1 outperforming Middle School 2, but there was not a statistically significant difference between Reading Normal Curve Equivalency (NCE) gain scores for Middle School 1 and Middle School 2.

Null Hypothesis 2

There will be no statistically significant difference in Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency NCE scores between the years of 2013 and 2014 of minority students in schools that have practiced data-driven collaboration more than three years as compared to TCAP NCE scores of students in minority groups in schools that have practiced data-driven collaboration less than three years.

The researcher utilized the participants in the minority group's fourth and fifth grade Math NCE growth scores from the 2012-2013 school year and the 2013-2014 school year from Elementary School 1, which has practiced data-driven collaboration less than three years and Elementary School 2, which has practiced data-driven collaboration more than three years. The Mean for the minority group from Elementary School 1 was -7.29 with a Standard Deviation was 10.11. The Mean for the minority group from Elementary School 2 was -1.62 with a Standard Deviation of 13.56. The researcher used a Two-Tailed *t*-Test that was tested at the Alpha level, $\alpha = .05$, to determine if the length of time of data-driven instruction influences minority students achievement. The Two-Tailed *t*-Test yielded at $p = 0.95$. The results led the researcher to retain the Null Hypothesis 2 for evaluating minority students Mathematics Normal Curve Equivalency (NCE) gains comparing Elementary School 1, which has used data-driven collaboration less than three years, and Elementary School 2, which has used data-driven collaboration more than three years. (TABLE 5 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

Table 5

Two-Tailed t-Test at the a = .05 Level Evaluating Minority Students Mathematics Normal Curve Equivalency (NCE) Gains Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	p-Value
1	21	-7.29	10.11	
				0.95
2	26	-1.62	13.56	

***Significant at p < .05**

The researcher utilized the participants in the minority group's fourth and fifth grade Reading Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Elementary School 1, which has practiced data-driven collaboration less than three years and Elementary School 2, which has practiced data-driven collaboration more than three years. The Mean for the minority group from Elementary School 1 was -5.43 with a Standard Deviation was 14.73. The Mean for the minority group from Elementary School 2 was -3.00 with a Standard Deviation was 13.85. The researcher used a Two-Tailed *t*-Test that was tested at the Alpha level, $\alpha = .05$, to determine if the length of time of data-driven instruction influences minority students achievement. The two-tailed *t*-Test yielded at $p = 0.72$. The results led the researcher to retain the null hypothesis for evaluating minority students Reading Normal Curve Equivalency (NCE) gains comparing Elementary School 1, which has used data-driven collaboration less than three years, and Elementary School 2, which has used data-driven collaboration more than three years. (TABLE 6 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

Table 6

Two-tailed t-Test at the a = .05 Level Evaluating Minority Students Reading Normal Curve Equivalency (NCE) Gains Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	p-Value
1	21	-5.43	14.73	
				0.72
2	26	-3.00	13.85	

***Significant at $p < .05$**

The researcher utilized the participants in the minority group's seventh and eighth grade Mathematics Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Middle School 1, which has practiced data-driven collaboration less than three years and Middle School 2, which has practiced data-driven collaboration more than three years. The Mean for the minority group from Middle School 1 was 0.58 with a Standard Deviation was 13.13. The Mean for the minority group from Middle School 2 was -1.20 with a Standard Deviation was 11.54.

Table 7

Two-Tailed t-Test at the a = .05 Level Evaluating Minority Students Mathematics Normal Curve Equivalency (NCE) Gains Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	Participants	Mean	Standard Deviation	*p*-Value
1	225	0.58	13.13	
				0.06
2	225	-1.20	11.54	

***Significant at p < .05**

The researcher used a Two-Tailed *t*-Test that was tested at the Alpha level, α = .05, to determine if the length of time of data-driven instruction influences minority students achievement. The Two-Tailed *t*-Test yielded at $p = 0.06$. The results led the researcher to retain the null hypothesis for evaluating minority students Mathematics Normal Curve Equivalency (NCE) gains comparing Middle School 1, which has used data-driven collaboration less than three years, and Middle School 2, which has used data-driven collaboration more than three years. (Table 7 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

The researcher utilized the participants in the minority group's seventh and eighth grade Reading Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and 2013-2014 school year from Middle School 1, which has practiced data-driven collaboration less than three years and Middle School 2, which has practiced data-driven collaboration for more than three years. The Mean for the minority group from Middle School 1 was -1.08 with a Standard Deviation was 11.90. The Mean for the minority group from Middle School 2 was 1.57 with a Standard Deviation was 11.54. The researcher used a Two-Tailed *t*-Test that was tested at the Alpha level, $\alpha = .05$, to determine if the length of time of data-driven instruction influences minority students achievement. The *t*-Test yielded at $p = 0.99$. Therefore, the results led the researcher to retain the Null Hypothesis 2 for evaluating minority students Reading Normal Curve Equivalency (NCE) gains comparing Middle School 1, which has used data-driven collaboration less than three years, and Middle School 2, which has used data-driven collaboration more than three years. (Table 8 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

Table 8

Two-Tailed t-Test at the a = .05 Level Evaluating Minority Students Reading Normal Curve Equivalency (NCE) Gains Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	Participants	Mean	Standard Deviation	*p*-Value
1	225	-1.08	11.90	
				0.99
2	225	1.57	11.54	

***Significant at p < .05**

There was not a statistically significant difference between minority students' Math and Reading NCE gains between Elementary School 1 and Elementary School 2 and Middle School 1 and Middle School 2.

Null Hypothesis 3

There will be no statistically significant difference in Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency NCE scores between the years of 2013 and 2014 of female students in schools that have practiced data-driven collaboration more than three years as compared to TCAP NCE scores of female students in schools that have practiced data-driven collaboration less than three years.

The researcher utilized the female participants fourth and fifth grade Mathematics Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Elementary School 1, which has practiced data-driven collaboration less than three years and Elementary School 2, which has practiced data-driven collaboration more than three years. The Mean for the females from Elementary School 1 was -1.75 with a Standard Deviation was 10.98. The Mean for the females from Elementary School 2 was -1.92 with a Standard Deviation was 11.34. The researcher used a Two-Tailed *t*-Test that was tested at the Alpha level, $\alpha = .05$, to determine if the length of time of data-driven instruction influences female students achievement. The Two-Tailed *t*-Test yielded at $p = 0.47$. The results led the researcher to retain the Null Hypothesis 3 for evaluating female students Mathematics Normal Curve Equivalency (NCE) gains comparing Elementary School 1, which has used data-driven collaboration less than three years, and Elementary School 2, which has used data-driven collaboration more than three years. (Table 9 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

Table 9

Two-Tailed t-Test at the a = .05 Level Evaluating Female Students Mathematics Normal Curve Equivalency (NCE) Gains Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	*p*-Value
1	63	-1.75	10.98	
				0.47
2	59	-1.92	11.34	

***Significant at $p < .05$**

The researcher utilized the female participants fourth and fifth grade Reading Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Elementary School 1, which has practiced data-driven collaboration less than three years and Elementary School 2, which has practiced data-driven collaboration more than three years. The Mean for the females from Elementary School 1 was -1.60 with a Standard Deviation of 13.39. The Mean for the female from Elementary School 2 was -1.93 with a Standard Deviation was 11.61. The researcher used a Two-Tailed *t*-Test that was tested at the Alpha level, $\alpha = .05$, to determine if the length of time of data-driven instruction influenced female students achievement. The Two-Tailed *t*-Test yielded a $p = 0.44$. The results led the researcher to retain the Null

Hypothesis 3 for evaluating female students Reading Normal Curve Equivalency (NCE) gains comparing Elementary School 1, which has used data-driven collaboration less than three years, and Elementary School 2, which has used data-driven collaboration more than three years. (Table 10 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

Table 10

Two-Tailed t-Test at the a = .05 Level Evaluating Female Students Reading Normal Curve Equivalency (NCE) Gains Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	p-Value
1	63	-1.60	13.39	
				0.44
2	59	-1.93	11.61	

***Significant at *p* < .05**

The researcher utilized the female participants seventh and eighth grade Mathematics Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Middle School 1, which has practiced data-driven collaboration less than three years and Middle School 2, which has practiced data-driven collaboration more than three years. The Mean for the females from Middle School 1 was 3.03 with a Standard Deviation was 12.94. The Mean for the female from Middle School 2 was 0.21 with a Standard Deviation was 10.86. The researcher used a

Two-Tailed *t*-Test that was tested at the Alpha level, $\alpha = .05$, to determine if the length of time of data-driven instruction influences female students achievement. The Two-Tailed *t*-Test yielded at $p = 0.01$. The results led the researcher to reject the Null Hypothesis 3 for evaluating female students Mathematics Normal Curve Equivalency (NCE) gains comparing Middle School 1, which has used data-driven collaboration less than three years, and Middle School 2, which has used data-driven collaboration more than three years. (Table 11 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

Table 11

Two-Tailed t-Test at the a = .05 Level Evaluating Female Students Mathematics Normal Curve Equivalency (NCE) Gains Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	Participants	Mean	Standard Deviation	*p*-Value
1	207	3.03	12.94	
				0.01*
2	191	0.21	10.86	

***Significant at $p < .05$**

The researcher utilized the female participants seventh and eighth grade Reading Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Middle School 1, which has practiced data-driven collaboration less than three years and Middle School 2, which has practiced data-driven collaboration more than three years. The Mean for the females from Middle School 1 was -2.71 with a Standard Deviation was 11.37. The Mean for the female from Middle School 2 was 0.66 with a Standard Deviation was 12.25. The researcher used a Two-Tailed *t*-Test that was tested at the Alpha level, $\alpha = .05$, to determine if the length of time of data-driven instruction influences female students achievement. The administration of the Two-Tailed *t*-Test yielded at $p = 1.00$. The results led the researcher to retain the Null Hypothesis for evaluating female students Reading Normal Curve Equivalency (NCE) gain scores when comparing Middle School 1, which has used data-driven collaboration less than three years, and Middle School 2, which has used data-driven collaboration more than three years. (Table 12 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

Table 12

Two-Tailed t-Test at the a = .05 Level Evaluating Female Students Reading Normal Curve Equivalency (NCE) Gains Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	Participants	Mean	Standard Deviation	*p*-Value
1	206	-2.71	11.37	
				1.00
2	191	0.66	12.25	

***Significant at $p < .05$**

There was not a statistically significant difference among female students' Mathematics and Reading Normal Curve Equivalency (NCE) gain scores between Elementary School 1 and Elementary School 2. However, the results showed a statistically significant difference among female students' Mathematics Normal Curve Equivalency (NCE) gain scores between Middle School 1 and Middle School 2 with Middle School 1 outperforming Middle School 2. There was not a statistically significant difference between the Reading Normal Curve Equivalency (NCE) gain scores for Middle School 1 and Middle School 2.

Null Hypothesis 4

There will be no statistically significant difference in Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency NCE scores between the years of 2013 and 2014 of male students in schools that have practice data-driven collaboration more than three years as compared to TCAP NCE scores of male students in schools that have practiced data-driven collaboration less than three years.

The researcher utilized the male participants fourth and fifth grade Mathematics Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Elementary School 1, which has practiced data-driven collaboration less than three years and Elementary School 2, which has practiced data-driven collaboration more than three years. The Mean for the males from Elementary School 1 was -1.51 with a Standard Deviation of 16.09. The Mean for the males from Elementary School 2 was -0.17 with a Standard Deviation of 14.38. The researcher used a Two-Tailed *t*-Test that was tested at the Alpha level, $\alpha = .05$, to determine if the length of time of data-driven instruction influences male students achievement. The Two-Tailed *t*-Test yielded a $p = 0.73$. The results led the researcher to retain the Null Hypothesis for evaluating male students Mathematics Normal Curve Equivalency (NCE) gain scores comparing Elementary School 1, which has used data-driven collaboration less than three years, and Elementary School 2, which has used data-driven collaboration more than three years. (Table 13 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

Table 13

Two-Tailed t-Test at the a = .05 Level Evaluating Male Students Mathematics Normal Curve Equivalency (NCE) Gains Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	*p*-Value
1	63	-1.51	16.09	
				0.73
2	77	-0.17	14.38	

***Significant at $p < .05$**

The researcher utilized the male participants fourth and fifth grade Reading Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Elementary School 1, which has practiced data-driven collaboration less than three years and Elementary School 2, which has practiced data-driven collaboration more than three years. The Mean for the males from Elementary

School 1 was 2.49 with a Standard Deviation of 14.35. The Mean for the males from Elementary School 2 was 1.01 with a Standard Deviation of 12.38. The researcher used a Two-Tailed *t*-Test that was tested at the Alpha level, $\alpha = .05$, to determine if the length of time of data-driven instruction influences male students achievement. The administration of the Two-Tailed *t*-Test yielded a $p = 0.26$. The results led the researcher to retain the Null Hypothesis for evaluating male students Reading NCE gains comparing Elementary School 1, which has used data-driven collaboration less than three years, and Elementary School 2, which has used data-driven collaboration more than three years. (Table 14 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

Table 14

Two-Tailed t-Test at the a = .05 Level Evaluating Male Students Reading Normal Curve Equivalency (NCE) Gains Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	*p*-Value
1	63	2.49	14.35	
				0.26
2	77	1.01	12.38	

***Significant at $p < .05$**

The researcher utilized the male participants seventh and eighth grade Mathematics Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Middle School 1, which has practiced data-driven collaboration less than three years and Middle School 2, which has practiced data-driven collaboration more than three years. The Mean for the males from Middle School 1 was -0.03 with a Standard Deviation of 12.35. The Mean for the males from Middle School 2 was -2.44 with a Standard Deviation of 13.19.

Table 15

Two-Tailed t-Test at the a = .05 Level Evaluating Male Students Mathematics Normal Curve Equivalency (NCE) Gain Scores Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	Participants	Mean	Standard Deviation	*p*-Value
1	233	-0.03	12.35	
				0.03*
2	196	-2.44	13.19	

***Significant at *p* < .05**

The researcher used a Two-Tailed *t*-Test that was tested at the Alpha level, α = .05, to determine if the length of time of data-driven instruction influenced male students achievement. The administration of the Two-Tailed *t*-Test yielded a $p = 0.03$. The results led the researcher to reject the Null Hypothesis for evaluating male students Mathematics Normal Curve Equivalency (NCE) gain scores comparing Middle School 1, which has used data-driven collaboration less than three years, and Middle School 2, which has used data-driven collaboration more than three years. (Table 15 illustrates the

Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

The researcher utilized the male participants seventh and eighth grade Reading Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Middle School 1, which has practiced data-driven collaboration less than three years and Middle School 2, which has practiced data-driven collaboration more than three years. The Mean for the males from Middle School 1 was 0.01 with a Standard Deviation of 12.47. The Mean for the males from Middle School 2 was 0.79 with a Standard Deviation of 11.80. The researcher used a Two-Tailed *t*-Test that was tested at the Alpha level, $\alpha = .05$, to determine if the length of time of data-driven instruction influenced male students achievement. The Two-Tailed *t*-Test yielded at $p = 0.75$. The results led the researcher to retain the Null Hypothesis for evaluating male students Reading Normal Curve Equivalency (NCE) gain scores comparing Middle School 1, which has used data-driven collaboration less than three years, and Middle School 2, which has used data-driven collaboration more than three years. (Table 16 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

There was not a statistically significant difference among male students' Mathematics and Reading Normal Curve Equivalency (NCE) gain scores between Elementary School 1 and Elementary School 2. However, the results did indicate a statistically significant difference among male students' Mathematics Normal Curve Equivalency (NCE) gain scores between Middle School 1 and Middle School 2 with Middle School 1 outperforming Middle School 2. There was not a statistically significant difference between the Reading Normal Curve Equivalency (NCE) gain scores for Middle School 1 and Middle School 2.

Table 16

Two-Tailed t-Test at the a = .05 Level Evaluating Male Students Reading Normal Curve Equivalency (NCE) Gains Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	Participants	Mean	Standard Deviation	*p*-Value
1	232	0.01	12.47	
				0.75
2	196	0.79	11.80	

***Significant at $p < .05$**

Null Hypothesis 5

There will be no statistically significant difference in Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency NCE scores between the years of 2013 and 2014 of economically disadvantaged students in schools that have practiced data-driven collaboration more than three years as compared to TCAP NCE scores of economically disadvantaged students in schools that have practiced data-driven collaboration less than three years.

The researcher utilized the economically disadvantaged participants fourth and fifth grade Mathematics Normal Curve Equivalency (NCE) gain scores from the 2012-2013 school year and the 2013-2014 school year from Elementary School 1, which has practiced data-driven collaboration less than three years and Elementary School 2, which has practiced data-driven collaboration more than three years. The Mean for the economically disadvantaged from Elementary School 1 was 3.92 with a Standard Deviation of 14.57. The Mean for the economically disadvantaged from Elementary School 2 was -0.21 with a Standard Deviation of 15.23.

Table 17

Two-Tailed t-Test at the a = .05 Level Evaluating Economically Disadvantaged Students Mathematics Normal Curve Equivalency (NCE) Gain Scores Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	*p*-Value
1	25	-3.92	14.57	
				0.85*
2	57	-0.21	15.23	

***Significant at *p* < .05**

The researcher used a Two-Tailed *t*-Test that was tested at the Alpha level, α = .05, to determine if the length of time of data-driven instruction influences economically students achievement. The administration of the Two-tailed *t*-Test yielded a $p = 0.85$. The results led the researcher to retain the Null Hypothesis for evaluating economically disadvantaged students Mathematics Normal Curve Equivalency (NCE) gain scores comparing Elementary School 1, which has used data-driven collaboration less than three years, and Elementary School 2, which has used data-driven collaboration more than three years. (Table 17 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

The researcher utilized the economically disadvantaged participants fourth and fifth grade Reading Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Elementary School 1, which has practiced data-driven collaboration less than three years and Elementary School 2, which has practiced data-driven collaboration more than three years. The Mean for the economically disadvantaged from Elementary School 1 was 1.04 with a Standard Deviation of 15.54. The Mean for the economically disadvantaged from Elementary School 2 was -2.67 with a Standard Deviation of 13.33.

Table 18

Two-Tailed t-Test at the a = .05 Level Evaluating Low Socio-Economic Students Reading Normal Curve Equivalency (NCE) Gain Scores Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	*p*-Value
1	25	1.04	15.54	
				0.15
2	57	-2.67	13.33	

***Significant at $p < .05$**

The researcher administered a Two-Tailed *t*-Test that was tested at the Alpha level, $\alpha = .05$, to determine if the length of time of data-driven instruction influences economically students achievement. The administration of the Two-Tailed *t*-Test yielded a $p = 0.15$. The results led the researcher to retain the Null Hypothesis for evaluating low socio-economic students Reading Normal Curve Equivalency (NCE) gain scores comparing Elementary School 1, which has used data-driven collaboration less than three years, and Elementary School 2, which has used data-driven collaboration more than three years. (Table 18 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

The researcher utilized the economically disadvantaged participants seventh and eighth grade Mathematics Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Middle School 1, which has practiced data-driven collaboration less than three years and Middle School 2, which has practiced data-driven collaboration more than three years. The Mean for the economically disadvantaged from Middle School 1 was 1.39 with a Standard Deviation of 11.52. The Mean for the economically disadvantaged from Middle School 2 was -1.49 with a Standard Deviation of 11.26. The researcher used a Two-Tailed *t*-Test that was tested at the Alpha level, $\alpha = .05$, to determine if the length of time of data-driven instruction influenced economically disadvantaged students achievement. The administration of the two-tailed *t*-Test yielded a $p = 0.01$. The results led the researcher to reject the Null Hypothesis for evaluating economically disadvantaged students Mathematics Normal Curve Equivalency (NCE) gain scores comparing Middle School 1, which has used data-driven collaboration less than three years, and Middle School 2, which has used data-driven collaboration more than three years. (Table 19 illustrates the

Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

Table 19

Two-Tailed t-Test at the a = .05 Level Evaluating Economically Disadvantaged Students Mathematics Normal Curve Equivalency (NCE) Gain Scores Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	**Participants**	**Mean**	**Standard Deviation**	***p*-Value**
1	186	1.39	11.52	
				0.01*
2	172	-1.49	11.26	

***Significant at *p* < .05**

The researcher utilized the economically disadvantaged participants seventh and eighth grade Reading Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Middle School 1, which has practiced data-driven collaboration less than three years and Middle School 2, which has practiced data-driven collaboration more than three years. The Mean for the economically disadvantaged from Middle School 1 was -0.98 with a Standard Deviation of 11.17. The Mean for the economically disadvantaged from Middle School 2 was 1.45 with a Standard Deviation of 11.29. The researcher used a Two-Tailed *t*-Test that was tested at the Alpha level, $\alpha = .05$, to determine if the length of time of data-driven instruction influenced economically disadvantaged students achievement. The Two-

Tailed *t*-Test yielded a $p = 0.98$. The results led the researcher to retain the Null Hypothesis for evaluating economically disadvantaged students Reading Normal Curve Equivalency (NCE) gain scores comparing Middle School 1, which has used data-driven collaboration less than three years, and Middle School 2, which has used data-driven collaboration more than three years. (Table 20 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

Table 20

Two-Tailed t-Test at the a = .05 Level Evaluating Economically Disadvantaged Students Reading Normal Curve Equivalency (NCE) Gain Scores Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	Participants	Mean	Standard Deviation	*p*-Value
1	186	-0.98	11.17	
				0.98
2	172	1.45	11.29	

***Significant at $p < .05$**

There was not a statistically significant difference among economically disadvantaged students' Mathematics and Reading Normal Curve Equivalency (NCE) gain scores between Elementary School 1 and Elementary School 2. However, the results showed a statistically significant difference among economically disadvantaged students' Mathematics Normal Curve Equivalency (NCE) gain scores between Middle

School 1 and Middle School 2 with Middle School 1 outperforming Middle School 2. There was not a statistically significant difference between the Reading Normal Curve Equivalency (NCE) gain scores for Middle School 1 and Middle School 2.

Null Hypothesis 6

There will be no statistically significant difference in Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency NCE scores between the years of 2013 and 2014 of non-economically disadvantaged students in schools that have practiced data-driven collaboration more than three years as compared to the TCAP NCE scores of non-economically disadvantaged students in schools that have practiced data-driven collaboration less than three years.

The researcher utilized the non-economically disadvantaged participants fourth and fifth grade Mathematics Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Elementary School 1, which has practiced data-driven collaboration less than three years and Elementary School 2, which has practiced data-driven collaboration more than three years. The Mean for the non-economically disadvantaged from Elementary School 1 was -1.06 with a Standard Deviation of 13.52. The Mean for the non-economically disadvantaged from Elementary School 2 was -1.16 with a Standard Deviation of 11.48. The researcher administered a Two Tailed *t*-Test that was tested at the Alpha level, $\alpha = .05$, to determine if the length of time of data-driven instruction influenced non-economically disadvantaged students achievement. The Two-Tailed *t*-Test yielded a $p = 0.48$. The results led the researcher to retain the Null Hypothesis for evaluating non-economically disadvantaged students

Mathematics Normal Curve Equivalency (NCE) gain scores comparing Elementary School 1, which has used data-driven collaboration less than three years, and Elementary School 2, which has used data-driven collaboration more than three years. (Table 21 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

Table 21

Two-Tailed t-Test at the a = .05 Level Evaluating Non-Economically Disadvantaged Students Mathematics Normal Curve Equivalency (NCE) Gain Scores Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	*p*-Value
1	101	-1.06	13.52	
				0.48
2	79	-1.16	11.48	

***Significant at *p* < .05**

The researcher utilized the non-economically disadvantaged participants fourth and fifth grade Reading Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Elementary School 1, which has practiced data-driven collaboration less than three years and Elementary School 2, which has practiced data-driven collaboration more than three years. The Mean for the non-economically disadvantaged from Elementary School 1 was 0.30 with a Standard Deviation of 13.64. The Mean for the non-economically disadvantaged from Elementary

School 2 was 1.47 with a Standard Deviation of 10.88. The researcher administered a Two-Tailed *t*-Test that was tested at the Alpha level, $\alpha = .05$, to determine if the length of time of data-driven instruction influences non-economically disadvantaged students achievement. The Two-Tailed *t*-Test yielded a $p = 0.74$. The results led the researcher to retain the Null Hypothesis for evaluating non-economically disadvantaged students Reading Normal Curve Equivalency (NCE) gain scores comparing Elementary School 1, which has used data-driven collaboration less than three years, and Elementary School 2, which has used data-driven collaboration more than three years. (Table 22 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

Table 22

Two-Tailed t-Test at the a = .05 Level Evaluating Non-Economically Disadvantaged Students Reading Normal Curve Equivalency (NCE) Gain Scores Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	*p*-Value
1	101	0.30	13.64	
				0.74
2	79	1.47	10.88	

***Significant at $p < .05$**

The researcher utilized the non-economically disadvantaged participants fourth and fifth grade Mathematics Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Middle School 1, which has practiced data-driven collaboration less than three years and Middle School 2, which has practiced data-driven collaboration more than three years. The Mean for the non-economically disadvantaged from Middle School 1 was 1.42 with a Standard Deviation of 13.45. The Mean for the non-economically disadvantaged from Middle School 2 was -0.85 with a Standard Deviation of 12.84.

Table 23

Two-Tailed t-Test at the a = .05 Level Evaluating Non-Economically Disadvantaged Students' Mathematics Normal Curve Equivalency (NCE) Gain Scores Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	**Participants**	**Mean**	**Standard Deviation**	***p*-Value**
1	252	1.42	13.45	
				0.03*
2	215	-0.85	12.84	

Significant at *p* < .05

The researcher used a Two-Tailed *t*-Test that was tested at the Alpha level, $\alpha =$ .05, to determine if the length of time of data-driven instruction influenced non-economically disadvantaged students achievement. The administration of the Two-Tailed *t*-Test yielded a $p = 0.03$. The results led the researcher to reject the Null Hypothesis for evaluating non-economically disadvantaged students' Mathematics Normal Curve Equivalency (NCE) gain scores comparing Middle School 1, which has used data-driven collaboration less than three years, and Middle School 2, which has used data-driven collaboration more than three years. (Table 23 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed *t*-Test)

The researcher utilized the non-economically disadvantaged participants fourth and fifth grade Reading Normal Curve Equivalency (NCE) growth scores from the 2012-2013 school year and the 2013-2014 school year from Middle School 1, which has practiced data-driven collaboration less than three years and Middle School 2, which has practiced data-driven collaboration more than three years. The Mean for the non-economically disadvantaged from Middle School 1 was -1.48 with a Standard Deviation of 12.65. The Mean for the non-economically disadvantaged from Middle School 2 was 0.14 with a Standard Deviation of 12.55.

Table 24

Two-Tailed t-Test at the a = .05 Level Evaluating Non Socio-Economic Students Reading Normal Curve Equivalency (NCE) Gain Scores Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	**Participants**	**Mean**	**Standard Deviation**	***p*-Value**
1	252	-1.48	12.65	
				0.92
2	215	0.14	12.55	

***Significant at *p* < .05**

The researcher used a Two-Tailed t-Test that was tested at the Alpha level, α = .05, to determine if the length of time of data-driven instruction influenced non-economically disadvantaged students achievement. The administration of the Two-Tailed t-Test yielded a $p = 0.92$. The results led the researcher to retain the Null Hypothesis for evaluating non socio-economic students Reading NCE gains comparing Middle School 1, which has used data-driven collaboration less than three years, and Middle School 2, which has used data-driven collaboration more than three years. (Table 24 illustrates the Mean scores and the Standard Deviation for each school in the comparison and the results of the Two-Tailed t-Test)

There was not a statistically significant difference among non-economically disadvantaged students' Mathematics and Reading Normal Curve Equivalency (NCE) gain scores between Elementary School 1 and Elementary School 2. However, the results showed a statistically significant difference among economically disadvantaged students' Mathematics Normal Curve Equivalency (NCE) gain scores between Middle School 1 and Middle School 2 with Middle School 1 outperforming Middle School 2. There was not a statistically significant difference between Reading Normal Curve Equivalency (NCE) gain scores for Middle School 1 and Middle School 2.

Null Hypothesis 7

There will be no statistically significant difference in Mathematics Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency NCE scores between the years of 2013 and 2104 of students in schools utilizing data-driven collaboration practices more than three years as compared to the Mathematics TCAP NCE scores of students in schools that practiced data-driven collaboration less than three years.

Based on the results presented above, there is a significant difference in TCAP ACHIEVE Math proficiency or NCE gain scores of students in the Middle School utilizing data-driven collaboration more than three years and Middle School utilizing data-driven collaboration less than three years in the following subgroups: majority, female, male, economically disadvantaged, and non-economically disadvantaged. Middle School 1, which had been practicing data-driven collaboration less than three years, outperformed Middle School 2, which had been using data-driven collaboration more than three years. There was not a significant different among minority students in the middle schools. There was not any significant difference between the two elementary schools.

Using the responses from the interviews presented below, it appears that seventh grade Mathematics teachers at Middle School 1 were utilizing data-driven instruction more than the Mathematics teachers at Middle School 2. The Elementary Schools seem to practice similar collaboration practices, which could account for there not being any significant differences.

Null Hypothesis 8

There will be no statistically significant difference in Reading Tennessee Comprehensive Achievement Program (TCAP) Normal Curve Equivalency NCE scores between the years of 2013 and 2014 for students in schools utilizing data-driven collaboration practices more than three years as compared to the Reading TCAP NCE scores of students in schools that practiced data-driven collaboration less than three years.

Based on the results presented above, there is not any statistically significant differences in TCAP ACHIEVE Reading proficiency or NCE gain scores of students in schools utilizing data-driven collaboration more than three years and schools utilizing data- driven collaboration less than three years.

Using the responses from the interviews, it appears that both Elementary Schools had similar collaborative practices in Reading. It also seems as if the Middle Schools had similar collaborative practices in Reading. This could account for there not being any significant difference in results.

Interview Question Responses

Interview Question 1: How often do teachers at your school collaborate?

Elementary School 1: To start off the school year we provide them a day of collaboration within their grade level or subject area prior to when the school year starting, so they came for a day at the end of July. K through 3 works within their grade level, and fourth and fifth are departmentalized, so they team up, the math and science teachers and ELA and Social Studies teachers. We also provide them block collaboration days each nine weeks, so they can gather and figure out their plans as far as their targets, looking at their pacing guides, planning out their assessments, and that kind of thing. We collaborate each Tuesday independently. Administration and the academic coach meet with grade levels or teams every Thursday to plan targets, lessons, and assessments. We have forty minute planning sessions. Now, last year either myself or admin came to their

Tuesday planning sessions. A little bit has changed this year due to the law. We can't require them to collaborative plan on Tuesdays anymore but some teachers still do.

Elementary School 2: In our building we pretty much collaborate two times a week during planning. The first planning session we lay out is on Tuesday during their time. They bring a skeleton of their plans. We have standards we have deconstructed at that point. We put that into lessons and talk about the different instructional strategies for Reading and for Math, just those two areas. Then on Thursdays we come back and finalize all the plans at that point for Reading and Math. Then we talk about individual students in different RTI groups and the different tiers. If they are struggling in tier 2 or tier 3; just touching base on what teachers can do to help students on Thursdays.

Middle School 1: Three years ago teachers had a day to collaborate, but it wasn't used for collaboration on a regular basis, and when collaboration did take place it was more about managerial items and student behavior. Last year, teachers were required to collaborate but administration did not attend, so it was not always productive. The academic coach met with ELA due to low test scores and a TNLEAD initiative. A 90-day plan was created to improve collaboration among the ELA teams. One grade-level team embraced collaboration more positively than the other two, so a second 90-day plan was created for them in which they began using data to plan for instruction but it wasn't until about February. This year we are required to meet weekly. Admin and the academic coach meet with their assigned content areas and it is more structured. Some content teams meet more often. Seventh grade Math collaborated more during the last three years than other grade level content areas. They also used data more to drive their instruction during the last three years.

Middle School 2: They had to collaborate. They had mandatory collaboration at least once a week, but teachers who believed in the process, they met after school on Fridays. They would meet during other planning. They would get together on weekends sometimes, but each content area had a structured planning session that was attended by myself, or one of the administrators every week.

Interview Question 2: If some teams collaborate more often than others, is there evidence of a difference in student learning? Explain.

Elementary School 1: This takes us back to after the first year, we had a problem with fifth grade math. We realized it was a lack of collaboration. The two teachers just didn't know each other. We used money from the TNLEAD grant to put resources into giving them double planning period once a week. They sat with the academic coach or administration for two forty-minute times for a total of eighty minutes. We had to map out all their targets for the week and all their assessments. We tracked their weekly tests, we tracked percent of proficiency, and we tracked their daily exit tickets. We had to kind of cookie cutter how they collaboratively planned but it was successful because their scores did grow. I think we really do see evidence in the teachers who really do collaboratively plan together and those that don't. They do have common clear target. Every Wednesday they turn in their planning sheet to me that has all of their standards with all their strategies and what their assessments are going to be. They have to turn in all their assessments. (Showed example of assessments). We review it and give them feedback on Thursday. Now in math fourth and fifth are using a pre- and posttest. Now what we do with that is they divide up the pre- and posttest by the specific standards and list the percentage of mastery on the pretest and then the percentage of mastery on the posttest for each student. When students take the posttest we do have conversations about these students who didn't show mastery on this particular target. Do we need to go back and reteach? What are they are going to do? So we have those conversations with them about that. On the Reading side of that we have them bring their Reading test and go informally go through and discuss each question. How many students missed number 1 and so on? Which question did most of them miss? Is it different from this teacher? Discuss which questions missed most and differences between teachers. Is it how you present material, is it a good question, or do we need to reteach. We started with math and added reading this year. As far as targets we also go in and do snapshots in all the classrooms. That is one thing the administrator looks for is that all the targets within the classrooms need to match if they don't there is usually conversation. If it's a day or two off it's ok. I think it is good for them to know someone is checking that, and that there will be conversation if the targets are off.

Elementary School 2: As far as other teams collaborating more often, I do know of a couple different grade levels in our building they do meet on Mondays to start the week off to make sure everyone understands the material and lessons, and to see if anyone needs any supplies or materials at the time; just to make sure that everything if fined tuned. That is our third and fourth grade. I will tell you that I am seeing a difference in the rigorous materials presented to the students and expectations for those students. You can also get sense when you walk through the grade levels, I do see the teacher variance has diminished quiet a bit. Everyone is on the same page teaching the same lesson at the same pace with EDI. So I am seeing that.

Middle School 1: I believe so. Sixth grade ELA, seventh grade Math, and eighth grade Social Studies collaborate more often, and you can see a difference in their test scores and their lesson plans as well. They are usually teaching the same targets at the same time. It is evident in seventh grades formative and summative test scores. Sixth grade has become more effective in using data to inform their instructional practices. Their common assessments are also more aligned to the standards.

Middle School 2: Yes, there is. Just in terms of grades. In terms of the different types of assessments and the different types of assignments that were given, and just something as simple as just listening to the conversations about the kids, the teams that really did a lot of collaborative planning didn't have as much negative comments about well so and so can't do it. Yeah, we all have kids that struggle, but I didn't hear that as much, that negativity amongst the teachers. It was different types of activities. They would actually plan hands on activities. They would do more group work, so if you were in the classrooms walking through you could hear the difference. You could hear accountable talk. They had a different sense in the classroom.

Interview Question 3: Drawing from your experience, what makes one collaborative team more successful than another?

Elementary School 1: I think the big part of it is the personalities. The personalities of the teachers and whether or not they are willing to work collaboratively, so I think a big part of that is building relationships. With us being so new, we spent a big part of the first couple of years building relationships. You have to build trust with one another and feel comfortable. You have to be able to let your guard down to discuss strengths and weaknesses. Another part is professionalism and coming to the sessions prepared and do your part. We do have grade levels that everyone doesn't do their part. Have to work with them to help them improve and support them anyway we can.

Elementary School 2: In thinking about collaborative teams, as you would think about that, I guess a team that is willing or they care enough to confront one another. I know that confront is kind of a harsh word, but they are able to say to one another freely that the lesson you created for this standard I don't know necessarily that it goes with that. When I break it down I see this. They are able to communicate without being offended and feel they are going to offend anyone by doing that. They are making sure they have the kid's best interest at heart. Those teams that work very well like that and that don't have any problems with addressing those issues and problems like that which come up. They collaborate better, and there is not as much tension. They are able to get to planning and talking about what they need to fix up if it's a standard or assessment that does not match the standard. They don't mind letting each other know. But they are also very solution oriented. They are also willing to say I might have something to help with that. They are willing to give those suggestions.

Middle School 1: How well they get along and trust one another. Everyone on the team pulls their own weight. They are not afraid to express their weaknesses and utilize their strengths to help each other improve student learning. They use data to help them plan and wonder what they can do differently or improve to be more effective. They are not afraid to be instructional leaders as well. The teams that are more successful are student focused.

Middle School 2: I have kind of addressed that, but essentially have to buy in from all the teachers involved. But more than that, the teachers have to feel like what they are bringing to the table is something that other people are going to listen to. We had one group where two teachers collaborated together; well, they worked together but excluded the third teacher. The third teacher was more experience and was a level 5. She had a lot of really good ideas but the two that were collaborating didn't take advantage of her experience, and she had a lot to bring to the table. Where as the math teachers who planned on Fridays and got together every available minute even weekends. You could just listen to their conversations. One would pop an idea off. One would say that's a good idea but I didn't like this, but what about this. It was ok to challenge when it was a functioning. When it wasn't functioning either the challenges were met with a lot of negativity or no one felt comfortable enough to challenge. You would just have a lot of head bobbing, and they would leave and do their own thing. And I think another thing that made it successful was coming together with a purpose. I would listen to their conversations. Ok, when we get together on Friday, I will have this done and you will do this. Then we'll tweak this and we'll do that. They always had a purpose for getting together; as opposed to, oh, it's collaborative planning. Ok, what are going to do and there they would sit waiting for someone to say, "What are we doing to do about this?" Those that were truly collaboratively working together they always accomplished something.

Interview Question 4: Describe a typical collaborative session.

Elementary School 1: Every grade level is different, so when I sit in with them I try not to facilitate. Typically the grade level chair facilitates. It's interesting when I go from grade to grade. They are all a little bit different but they are all effective. Some grade levels have maybe experts on all subjects especially K-2 where they teach all subjects. So one teacher has maybe researched the pacing guide and knows exactly where they are and emailed everyone to let them know what to bring. Then everyone brings resources just for that standard. Second grade is very organized. That is how they do it. Where some are not as prepared and sit there and say let me grab that. I can see a big difference between the collaborative sessions. How effective they are depends on how prepared they are. Where we kind of are at now is since we have been working on assessments for a while is we start with the test they already had for that standard and they work to tweak and say do we think this is a good question? Can we change it? That kind of thing. We have not done yet where everyone brings a question for that standard. That is a great next step, but we just aren't there yet. We usually just start with what we already have. We are creating all of our own assessments. We aren't quiet there yet, where each teacher makes their own assessment items.

Elementary School 2: In our sessions that we get together and meet on Tuesdays and Thursdays most typically you will find that one particular person or that two people on a grade level are working together to get core instruction, so they have come together to get that skeleton of plans laid out and some instructional strategies that break down throughout the week. You can get a sense of it as we go around the table and talk about on Monday we will do this. This is how we are going to get the kids hooked and interested and started on the topic and this is how we are going to teach this particular standard or skill. Moving forward, and everyone takes a part in the ownership of that. We are passing resources and pulling resources in. We work hard to help all grade levels to feel free to input at all times. There are some grade levels, about three, that are really comfortable sharing anything or telling each other anything. During the Tuesday session the focus is on getting the best instructional strategies in there that we can. Then taking ownership on Thursday of finalizing everything and making changes as necessary. Saying this is what I have done to change it or fix it. Then leading into talking about our actual students. This one is in our RTI group. I have a real concern for him. We need to keep him on our radar. This is what I am doing in the classroom to help him. This one isn't in a tiered group but maybe needs to be moved into one. Or this student needs to change to another group. We are always talking to one another, so it's not just a one-person show. We are in this together. When I said three out six, it's probably more like four out of six of the teams are willing to share and others are a little bit more reserved, but we are working on that and we are getting there.

Middle School 1: This year we are focusing on DuFours' 4 collaborative questions when we collaborate. Admin and the academic coach have worked together to set goals for collaboration and meet with their assigned content area weekly. We also have celebrations to recognize our successes based on achieving the set goals. Content area teams were allowed to set their next goal to be accomplished by Christmas break to establish ownership of the collaborative process. Admin and the academic coach meet weekly to discuss each content areas progress and get advice on how to move their groups forward. Teachers create common targets and assessments that are standards based. Test questions are carefully aligned to the standards. Teachers are beginning to discuss the data from assessments and use it to design their lessons. Grade level content areas are not all at the same level of collaboration. Some have already moved to using data to differentiate instruction for their students while some are still working to create common pre and post assessments. This has not always been the case. Last year collaborative partners would meet but sometimes they would just sit in the classroom together and do their own thing. Not all members on the same grade level and content area had planning together so it made it difficult to collaborate.

Middle School 2: A typical dysfunctional or functional one? Let's do the dysfunctional one first. The dysfunctional on was we all here or we are waiting for somebody else. It takes somebody else to say ok, what are we going to work on today, did you bring this, what is coming up? It was truly dysfunctional. It was a meeting that people sat through looking at their watches, and they would have to go make phone calls or do whatever. You would hear a lot of I'll work on that at home, and I'll email you a copy of it. There was very little of anything that was created together. So it was; what do they say? It's not group work; it's situational seating. No, it's proximity seating. That was what it is. It wasn't collaboration; it was just proximity seating, and it really was. They would play lip service. I'm not saying that 100 % of the time nothing was accomplished, but it was like pulling teeth. And it required facilitation by whoever was in charge of the group as opposed to 8th grade math whether anybody showed up or not. They showed up with their agenda. They would say last time you said you were going to bring this. Here I brought this. What do you think about this? I feel good about this? Can we tweak this? They would have the next two weeks mapped and be thinking about what are going to do for the next unit. I mean it was like clock work, and they were enthusiastic. They weren't just meeting. Their attitudes weren't begrudging. Really a lot of it came down to attitude, as opposed to sitting there with their arms crossed. It was the body language. They sat up, had papers spread, computers were opened, saying, "Oh, I had this great idea. Did you look at what I sent the other day? What did you think about it? We could tie that with this and it was ideas beget ideas. It was fun to watch because as a facilitator that was truly what it was. I was the facilitator, and I would get excited about it and say that was really cool. And I can come in and do a close read because I know something that would go with that. It would get other people excited about it. But you could go in the classrooms too and get excited about it. Another thing I noticed about functional groups, they would go watch each other teach voluntarily. I mean they would do that on their own, and would come back and reflect on their own teaching. They were doing the lessons at basically the same time, and they would look at the data and say yours did better than mine and we did the same thing. Next time we do something similar, I'm going to come watch you and I mean they were completely transparent, completely opened about everything from the numbers, the resources, and the whole nine yards. So it was very different. You could totally tell the difference. You tell when you went into the classroom too.

Interview Question 5: How has collaboration changed at your school over the past three years?

Elementary School 1: I think now it is more natural. Everyone has gotten to know each other. I think now I feel like it is more data-driven. At first it was just what are the strategies we are going to use and what are the targets we are going to cover, but now we look at assessment and go backwards from that. So that has changed the past three years.

Elementary School 2: Well, as far as it changing it has definitely evolved into that team sense, the sense that these are all of our children in this grade level. It's not just my classroom of 20-25 children, but all of these kids are ours. What are we going to do to best meet these needs? We have always spent time in our own rooms but now we are doing it on a level that is the biggest opportunity to make the most changes in the lives of our students. And with the planning system we have; there is a template that we are using that makes sure we have all the phases embedded in there to make sure we don't forget something that is very crucial to make the development of that skill. It has changed tremendously in the ownership of the children and the expectations of students.

Middle School 1: It has evolved from a time that teachers could collaborate to a set time that teachers are required to collaborate with admin or the academic coach present to direct discussions when needed. Teams focus on DuFour's 4 questions for collaboration and have short-term goals that they helped establish. Previously, there was not any set format for collaboration. Most of time teachers just sat in the room together or discussed problems they were having with student behavior. It is more focused now with an agenda.

Middle School 2: It went from none to we started with staff development on what does collaborative planning look like. People who were doing a form of it, we would talk to them. The last two years were the structures, so if we go back three years we kind of I don't' want to say piloted, but groups that were always collaborative we talked to them and asked, what does that look like? How does that work for you? We really started to look at assessments and the structure. We changed our schedule and built in structured times with the two plannings because we noticed that planning times were not being used effectively shall we say. And it was very structured. Collaborative planning was set to where I usually went to math. We each had our content area, but occasionally we would rotate so we could see we could see what was going on in the other ones. But we mainly went to the same ones to get that rapport with teachers, and then we noticed that there was a lot of compliant meetings. And we started looking at what made the ones effective and what made the other groups ineffective. It was things like the use of an agenda. They had norms, but they didn't officially set norms. The expectations were there we are meeting at this time and everybody be there. You know the comfort level with those groups and a lot of it had to do with the transparency. The biggest struggle was that it isolated the weak teachers that did not have as much to bring to the table when you were tasked with bringing something, and you're seeing the quality things the others are bringing and you're stuck with garbage. Then you got one of two things, you don't bring anything and you shut down, or you stepped it up and think I need to bring something next time. Administrators were always there with expectations, to be part of the group, and to show interest in the level of accountability that they expected from the teachers to do that. When I left last year, it still wasn't all perfect, but the grumbling wasn't there. It was the way we did business now. You just knew that during collaborative planning that is what you did, and he had put into place that you would have an agenda and that made things go a little bit smoother. Just doing some of the characteristics of a PLC with the groups. It really did transition from isolated groups meeting because they knew it was the right thing to do to everybody in the content areas had a place to be on this day and at this time. The expectation was that you would have something to show for it.

Interview Question 6: To what extent do collaborative teams use data? What data do they use?

Elementary School 1: They use it to make instructional decisions such as strategies, if they need to reteach and to decide on pacing.

Elementary School 2: Collaborative teams use a variety of data resources for data in our building. We start with TCAP information that we get back, any state assessments whether it be writing, putting children in groups, desegregating the data to be able to know where everybody maybe not having success so we can meet their needs. This year we have been using the universal screener, path driver, as a data starting point. Then from there drilling down even further in the younger grades with the QPS screener in the younger grades that actually tells the area. The universal screener may tell us it's a fluency problem, but we know if we dig down further and deeper into that, the problem may lie in some it's a fluency phonics issues. The QPS screener helps us to drill down even further. In our building we do something. Of course we have our district benchmarks in grades 3-5 for science and social studies. But at the same time we also do in house or in building ELA and Math benchmarks for grades 2-5. We felt that it was crucial for 2nd grade to come on board for this to help prepare students make the transition to high stakes assessments in the upper grades. We have a time frame we adhere to and the time frame is pretty much like TCAP. We use this data from the assessments to determine which students have not mastered standards. We have a template that students are listed on and monitor through small group instruction in order to close the gap that might exist. I help to point out trends that we see that relate to TCAP. For example if we see that our African American males across the board for 3, 4 and 5 have been missing AMO, so we use the data from benchmarks and other assessments to help close the gaps in learning. We use it to make sure we are forgetting any subgroup. We are working hard all the time to do that. They are responsible for bringing their data for data chats including universal screeners and benchmarks to discuss and design lessons from it. Data is our friend.

Middle School 1: Most teams do not use data to drive their instructional decisions. Sixth grade ELA has begun to use the data to make sound instructional decisions about individual students and the strategies they use. At the beginning of the year, the school reviews their TCAP achievement and growth data as a whole group but have not referred back to it in the past. This year teachers were given their RCPI data and used it to determine their strengths and areas to improve. Teachers were also given their student RCPI data to help them determine categories and standards students might have difficulty learning. Teachers are beginning to create quality common assessments that can be used to make instructional decisions but most have not progressed to using the data beyond re-teaching whole group. Some groups still do not use the data to drive their instruction.

Middle School 2: That is something we were still working on. And that is something I noticed a lot was we looked at data for data's sake but what does anyone really do with it. We changed our grading system to 70 percent assessment and 30 percent other stuff. We spent a lot of time talking about what is an effective assessment. What counts as an assessment? We pulled peoples grades and looked at what they counted as an assessment. And talked more about what we can do with that data. With just the grading data because if you truly are assessing, then it should give you some information that will allow you to modify your instruction. We had Learning Links. Some would look at learning links, but it would give you an indication but not always accurate. I think math probably used classroom data. They would actually really look at it and look at scores on their tests. They assessed fairly frequently, and they would look at it and compare them. They would go watch other teachers, and say I think I did the same thing. But then they would go watch her teach, and I realize she goes a little bit slower than I do. She'll spiral round a little more than I do, and I go too fast and go straight into work these by yourself. She does a couple more examples than I do. They used it more to modify their instruction, where originally it was just looking at the test grades. I know they spend more time at the beginning of last year looking at TCAP data. I wasn't part of that, but I remember he had a different kind of form he had them look at. He had them spend a little more time looking at how their students had done. But they spent more time looking at where their students were coming in at, and they spent a lot of time looking at areas where their students were coming in low at. Kind of looking at target areas. Like I said I wasn't a part of that, so I can't speak too detailed on it. This year they are transitioning to using the data more. I want to say tracking it in some way. But we had talked about the data, so what are you going to do with it. What can these numbers tell you? I think a lot of teachers have the data and know they should use it, but don't know how. The don't know quiet what to do with it or what it can tell them, so they are working on doing some professional development on I have the data, so now what? There were no common assessments at first, but we were moving toward it. Last year the expectation was there on having the common assessments. It went from now we are just meeting to we are meeting with a purpose to know we are meeting to create these common assessments. Then we gave the common assessments, and some teachers were like now we are going to move on. Then it was no we aren't just going to move on. These common assessments are going to tell us something. Once again it went back to transparency because some of those common assessments they didn't do so well. I know one of the things the ELA groups struggled with especially was they were like we are doing this story and she is doing that story, so we can't do a common assessment. We had to say hold up, you aren't teaching the story. You are teaching the skills. You are teaching the standard, so it doesn't matter if you are using the "Outsiders" and she is using "The Witch of Blackbird Pond". It doesn't matter. You teaching these standards here, so you can use a third test to test the students on the standards. They were like oh. Right there it became clear that this was another mindset that had to be shifted from teaching story to teaching the standards. Then once you did that, you could move to looking at individual teaching styles.

Interview Question 7: Do you feel teachers at your school use data with fidelity? Explain.

<u>**Elementary School 1**</u>: Some do. Third through fifth do maybe cause of the nature of TCAP they take at the end of the year. Particularly in math because I feel like it is easier for them to keep up with the pre- and posttests, and the assessments are more time efficient when giving. They are heavily data-driven. Fourth and fifth do use RCPI data from the year before to form groups. We definitely keep an eye on those. I will say that Kindergarten; they are a beast of their own. They are very data-driven because of their report card being very standards based. They have to keep track of each child's data, so that definitely determines their instruction. First and Second grade, I think they

are beginning to use data. They keep data such as oral and written fluency and that sort of thing, but we don't really have assessments or clear benchmarks to track data. I think we would like to see pre- and posttests in math. But then again I don't know if it's quiet age appropriate for them at this time but more so for third, fourth, and fifth. Yes, we do use data with fidelity here.

Elementary School 2: I do feel we do in our building, but now I don't think this was always the case. I think it has evolved to this as we have moved through the past few years. We know as teachers the accountability piece has never been higher, and they realize that in the data collection process they are very attuned to the fact that if they don't use that data effectively they aren't going to get their children at the end result, so I really believe they use it whole-heartedly to say here is the problem identified and now here's what I'm going to do and here's the instructional strategies that I am going to get this child to mastery level. I really believe that they are doing that on a consistent basis. If for some they do veer off from that, they are quickly brought back in because after the fact we come and assess them again. So they know we have another common assessment that the grade level creates, so if for some reason they might have veered off it will show in that common assessment. And for the most part everybody keeps on track. They know this is our goal and this is where we are going with that.

Middle School 1: Not yet. I think teachers are beginning to understand the importance of quality assessments that align to the standards, so they can have accurate data to use. But I don't feel they can use the data with fidelity yet. Sixth grade ELA and seventh grade Math would be the groups that are closest to using data with fidelity. They have begun designing their instruction based off the data but have not mastered the process yet.

<u>Middle School 2</u>: There's pockets of it. I really think it goes back to them learning what to do with it and moving away from I don't have time to reteach. Well, if your data indicates that you have a group of students that didn't get what you taught, then that is what you are supposed to do. The data tells you that you need to. With fidelity no, but they are moving toward it, but I don't think it is yet.

Interview Question 8: What is the biggest difference between teachers at your school that use data with fidelity and teachers who do not?

<u>Elementary School 1</u>: Well, our teachers who do use data with fidelity do have higher test scores. A lot of time our newer teachers are trying to get use to curriculum and classroom management, so sometimes let that kind of fall to the side. I will say that our teachers who know their students and keep track of their data especially by standard and RCPI groups their students do perform better.

<u>Elementary School 2</u>: That does factor in sometimes. In the experiences that I have seen we don't quiet see the growth that could happen, or that could be attained from that. It doesn't happen very often but when we have our data chats everybody has a voice and one thing that we do is that we put it all out there. If you are a fourth grade teacher there is your name with the scores and your proficiency level. You are held to that standard of maybe I didn't score so well because I was off scope and sequence or was it because I didn't follow the plans or whatever it might have been. Ultimately it might have been it was because they may have not been able to get to that particular thing because they were out of scope and sequence. But all together looking at their data and where they need to go, those folks that have fidelity generally have higher scores. We are finding than those that try to do things the older way, seasoned teachers will sometimes get into the mindset that I've done this for years, and I am going to do it the same way, but the standards are not written the same way and expectation is not the same. So you find that sometimes we aren't rising to the occasion because we aren't bumping up the rigor. So yes, there can be a difference between those teachers that have fidelity but they don't like to come back and say my kids didn't grow, so they are pretty faithful because I didn't do what I was supposed to, so they are pretty faithful usually.

Middle School 1: They use the data to discuss individual students and divide the class into groups based on scores. Then design their lessons to meet the needs of the students based off the data. They change their instructional strategy when it is not being effective in improving student learning. They differentiate based on student needs.

Middle School 2: A. Re-teaching happens more often. I can remember that I was in a sixth grade science classroom and she had given a test the day before. I came in the next day, and she was calling kids up giving them half sheets/worksheets or whatever that focused on the standards. They had collaborated together, but she was the only one who retaught like that. It was specific standards based activities that addressed what the test showed. It was the simplest way to do it. She just had it right there. She had re-teaching activities for all four and enrichment activities for the kids that didn't need it. She just called them up, passed it out, and that is what they worked on. Simple. So she had really used that. The Math teachers really used it to refine their instruction and also for the re-teaching. They talked about it with their kids more. They were arranging their tests more by standard, grouped by standard, so the kids had a better idea of truly what they didn't get as opposed to a fifty-question test that covers stuff. They knew if they got questions 1through 5 wrong, they didn't know how to do two-step equations or whatever it was. And I just think the ones that really looked at data were the ones that had worked together to create something that gave them something worthwhile to look at. If you aren't collaborating very well and your not really coming up with a common assessment or not coming up with a quality common assessment. Then you get the numbers from it. What does that really tell you? It doesn't tell you anything, so you can't use it with fidelity if you don't know why you got what you got.

Interview Question 9: Based on data, do you think collaboration has a more positive affect on economically disadvantaged students compared to non-economically disadvantaged students? Explain.

Elementary School 1: Well, I can see how it would have more of an impact because possibly the disadvantaged students aren't going to get the extra support at home, so maximizing their time in classroom is definitely going to be more beneficial. But if teachers use data and use it to drive their instruction all students are going to benefit regardless of economical situation.

Elementary School 2: I do believe this. I have spent a bulk of my career at a school up the road with a population that is much different. But my point is too that there used to be a time that we planned our lessons and if we saw someone in the hallway that taught the same subject and grade we did that we may talk and bounce around some ideas. But we didn't necessarily sit down at the table with the best of the best. It would be our ideas and our thoughts, and we would go back to our room and close our door. But Collaboration has really moved forward and very progressive in the sense that taking the best of all five or six people and we are putting them together where everyone comes together with a different bag of tools with them, so when all get in a room and start to talk about the different strategies we end up with the best of the best. Also knowing that a lot of teachers may have different backgrounds and different experiences in teaching in those areas. Economically disadvantaged students have a different set of needs and that is just in my opinion. Because of where I taught before they focused on different things. It's like a poverty level and with that depending on the level of poverty, a school's focus is very different. Very different as far as cultures and what they have to focus on at school and how they feel. I just believe you have to get to know your students and build their trust and a relationship with them. When you do those kinds of things and can share that with a colleague, and you can help if someone is having a behavior problem in their class. You can share some of the strategies you have used in your class to help them. Find out what some of their interests are. Make a connection and a connection at home. Find a resource you can work with that child with. Then once that other teacher can use that possibly as an intervention to get them to do better in school. I know that the experiences I have had before in the past it's because I have been able to do something like that to get them on board or their parents on board and help realize their potential and that they can do. Let them know we love them and care about them and want them to succeed. So having a room full of teachers pulling on their experiences can help in that process and help with those economically disadvantaged children. And I think we are seeing more of that in our society. I know even our county is seeing an explosion of that population and we have got to realize that working together is a solution to that. But I definitely think collaboration has a more positive effect on it.

Middle School 1: I think if you are using data to meet the needs of each of your students in your classroom, then all students regardless of their socio-economic status are going to benefit.

Middle School 2: I think there is just because in the collaboration sessions I have been in, they know their students. That is another key point. You have to know your kids, and these teachers knew their kids, and knew what their kids were going to struggle with. So their instruction would be tailored more for the population of kids. You just know you are going to have that group of kids, usually your subgroups that are going to struggle. And we did focus the year before specifically on those subgroups, pulling those demographic reports. You know from test drive. Really identifying what kids are we going to target for this. That was another way of using data. If they put anything into Test Drive, that was another way of pulling information, so I think it does benefit because in that collaborative session they would have discussions on the whole class. It wasn't we are going to teach chapter 7, section 3, and we are going to do these problems, and we are going to move on. It was ok, we know the kids that struggled with this concept, and I've got five that didn't get it so I'm going to have to this. Whether they fall into the economically disadvantaged, you know, but if we just look at the at-risk students in general for whatever reason, I think yeah it does, just because they are more aware of the whole lesson. They tend to be more thorough building in the re-teaching things that will help anybody who struggles with it. As far as any at-risk student, yeah, especially when you start looking at RTI. You know what tiers. Collaboratively when are thinking about that, you are taking all those concepts into account when you design your lesson, so that makes it a richer lesson than if you are just teaching the book.

Interview Question 10: Anything else?

Elementary School 1: The two teachers we were talking about in 5th grade that were tracked for TNLEAD and collaborated with more rigorous guidelines had growth from 12-13 to 13-14. We also noticed these two teachers fell, so we used these tracking sheets to track their exit tickets. At our school the top achieving students are the ones we have difficulty growing. We tracked these students as well.

Last year just 5th grade math tracked exit tickets that were 5 questions and had to record in chart. This was very time consuming, but it did prove to work because their scores did go up. When we met this summer to collaborate, they wanted to switch to pre- and posttests. They were allowed. They just had to show they used pre-test data to drive their instructional decisions and were conscience of the posttest data. That was our agreement to track data this year. Third, fourth, and fifth are all using it this year because of the problem last year. We have charts for each grade level in the office to record our assessment data to track progress. Teachers are responsible for recording the data. Some grade levels are better about recording information than others.

Elementary School 2: Collaboration is hard work. It is challenging work and it is demanding work, but we are reaping rewards everyday for these kids. We are hitting milestones, giving them goals and setting goals. They are just great kids and it is helping them get to their full potential. I just think collaboration is where it is at. We can deconstruct the standards by ourselves all day but if we compare our list of the same standards we would have differences. Some with things you had missed and some with things I had missed. But together coming up with that, it's that accountability piece and that is everybody is important and we are in this together. It is a nice change. Then if we need to build content knowledge that is the part that is the hardest for people is to realize maybe I don't have enough content knowledge. And if you don't, that hopefully we are trying to empower teachers to get that and if not, by themselves, but come to me or go to a colleague you feel comfortable with. We have done a PLC in the building that is delving into the standards, the Common Core Math standards. We have looked at the domains and strands and looked through them and how they vertically progress and made lesson plans to go with those. We deconstructed those standards and so forth. We did the same type of thing when we looked at the ELA standards last year and how one of the strands deconstructed. We did lesson plans with those things as well. We integrated them. They have just done some fabulous work. It has been tough work and it's been hard work. I hope they go back to those lesson plans. Then they realize sometimes when I was thinking this I thought it meant this but in looking back it wasn't. It is a learning process, but learning and being able to change what we are doing. They are building content every day with all this Common Core that we are doing.

Middle School 1: We are anxious to see our test scores from this year since our collaboration time is more focused on meeting student needs. We are creating quality assessments that are more clearly aligned to the standards, and we are beginning to look at the data to determine areas to reteach with some teams differentiating their instruction based on the data.

Middle School 2: Nothing that I can think of. I just know it took a strong presence and a lot of encouragement. It took teachers that were doing it to talk about rather than it being mandated from administrators, the ones that really were involved with it. Well, our TNLEAD innovation group was dealing with the protocol and it had a lot more credence when it came from the teachers than when it came from the administrators.

Summary

After completing Two-Tailed *t*-Tests at the Alpha level, $\alpha = .05$, the researcher found that there was not any statistically significant differences between Elementary School 1, which had practiced data-driven collaboration less than three years, and Elementary School 2, which had practiced data-driven collaboration more than three years. Based upon the responses from the interviews, this could be due to the similarities between the collaboration practices. The researcher did find statistically significant differences among the Middle Schools in the following subgroups: majority, female, male, economically disadvantaged, and non-economically disadvantaged. Middle School 1, which had practiced data driven collaboration less than three years, outperformed Middle School 2, which had practiced data driven collaboration more than three years. Based upon the interview responses, this could be due to seventh grade Mathematics at Middle School 1 using data longer to drive their instruction even though the school did not practice data-driven instruction as a whole.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to determine if the length of time a school utilizes data-driven collaboration has a positive effect on student achievement among the following subgroups: majority, minority, female, male, economically disadvantaged, and non-economically disadvantaged. Mathematics and Reading TCAP NCE gain scores were used to administer Two-Tailed *t*-Tests, calculated at the Alpha level, $\alpha = .05$, to test eight hypotheses. The researcher analyzed the data from two elementary schools, one of which had practiced data-driven collaboration less than three years and one had practiced data-driven collaboration more than three years. The data from two middle schools, one of which had practiced data-driven collaboration less than three years and one had practiced data-driven collaboration more than three years, was also analyzed.

Conclusions

When comparing the differences between NCE growth scores of students who took the Mathematics TCAP in the 2012-2013 school year and the 2013-2014 school year, there was a significant difference in the results of TCAP NCE gain scores of students in the Middle School utilizing data-driven collaboration more than three years and the Middle School utilizing data-driven collaboration less than three years in the following subgroups: majority, female, male, economically disadvantaged, and non-economically disadvantaged. Middle School 1, which had been practicing data-driven collaboration less than three years, outperformed Middle School 2, which had been using data-driven collaboration more than three years. Even though *p*-value of 0.06 resulted from the *t*-Tests indicated that the minority student scores were extremely close to the significance level of 0.05, there was not a statistically significant difference in the results of Mathematics TCAP NCE gain scores of minority students between Middle School 1 and Middle School 2 due to the small sample size. There was not a statistically significant difference between the two elementary schools in Mathematics NCE gain scores.

It can be concluded from the Two-Tailed *t*-Test results and interview responses that the seventh grade Mathematics teachers at Middle School 1 were utilizing data-driven instruction more effectively than the Mathematics teachers at Middle School 2. The Elementary Schools seemed to practice similar collaboration practices, which could account for the lack of statistically significant differences in results.

When comparing the differences between Reading NCE scores, there was not any statistically significant differences in the TCAP NCE gain scores of students in schools utilizing data-driven collaboration for more than three years and schools utilizing data-driven collaboration less than three years.

It appears from the interviews that both Elementary Schools had similar collaborative practices in Reading. It also seems as if the Middle Schools had similar collaborative practices in Reading. This could explain the lack of statistically significant results.

The limitations in this study should be considered when reviewing the results. The first limitation was the TCAP was the only tool used to measure gains in TCAP NCE scores in Mathematics and Reading between the schools that utilized data-driven collaboration less than three years or more than three years. Analyzing common assessments given to students along with TCAP scores would provide a more accurate account of student learning.

The fact that each school did not seem to have the same definition of data-driven collaboration could have caused the data to be inaccurate. It also did not appear that all teachers in each school used data with fidelity, which could have been the reason for Middle School 1 outperforming Middle School 2 in Math in five out of six subgroups. The high mobility rate in the district could also be a factor in student achievement results as well, due to the fact that 22 to 40 percent of the students in the schools that participated in the study move yearly. This does not allow students to benefit fully from data-driven collaboration or provide an accurate measure of the effects of data-driven collaboration.

Recommendations

This study was limited to fourth, fifth, seventh, and eighth grade students at two elementary and two middle schools. It would provide more accurate data if all elementary and middle schools in the district participated in the study in order to accurately measure the effects of data-driven collaboration on student growth. It would also be beneficial if a definition of data-driven collaboration were provided to interview participants in order to have consistency in understanding what data-driven collaboration is. If other measures of student growth were used and a definition of data-driven collaboration were provided to those being interviewed, the research may produce different results. It would also provide a clearer picture of the level of collaboration of the schools and teachers in the district, so the appropriate professional development could be provided in order to make data-driven collaboration more effective and increase student learning.

It would be beneficial if other counties with similar demographics and higher achievement scores participated in the study in order to determine if they use data-driven collaboration and how the practices of these counties compared to the one in this study. This would have helped the district refine collaboration practices to better meet the needs of the students.

It would be helpful if a survey were given to the teachers in the grade levels that participated in the study to determine the fidelity in which they used data to drive their instructional practices. It would also be beneficial to know the number of years of experience of each teacher, and what professional development training they had been given on effective data-driven collaboration practices. It would also benefit if students were given a survey to determine if they did their best on the TCAP in order to know if the results of the study were accurate. This information would make the study more valid and provide the district with vital information to improve the collaboration practices among teachers.

If the above recommendations were applied to further research, it would also benefit other school districts in understanding the effects of data-driven instruction on student learning. Districts would be able to provide appropriate professional development in data-driven collaboration in order to increase student learning. It would also benefit students because it would reduce the variability among classrooms and provide them with instruction that meets their learning needs.

REFERENCES

Alber, R. (2011, December 6). Three ways student data can inform your teaching. [Web log comment]. Retrieved from www.edutopia.org/blog/using-student-data-inform-teaching-rebecca-alber

Barth, R. S. (2006). Improving relationships within the schoolhouse. *Association for Supervision and Curriculum Development 63*(6), 9-13.

Bernhardt, V. L. (2009). Data use: Data-driven decision-making takes a big-picture view of the needs of teachers and students. *Journal of Staff Development, 30*(1), 24-27.

Berckemeyer, J. (2013). Becoming a team. *Association for Middle Level Education, 1*(1), 10-13.

Boettcher, C. & McCann, K. (2013). Communication and commitment. *Association for Middle Level Education, 1*(3), 46-47.

Biro, M. M. (2013). 5 leadership secrets of collaboration success. *Forbes.* Retrieved from www.forbes.com/sites/meghanbiro/2013/07/28/5-leadership-secrets-of-collaboration-success/

Carroll, T. G., Fulton, K., Doerr, H. (2010). Team up for 21st century teaching and learning: What research and practice reveal about professional learning. *National Commission on Teaching and America's Future.* Retrieved from http://nctaf.org/announcements/team-up-for-21st-century-teaching-learning/

Center for Comprehensive School Reform and Improvement (2010). *Maximizing the impact of teacher collaboration.* Retrieved from http://www.education.com/print/Ref_Maximizing_Impact/

Center on Instruction (n.d.). *Using student data to drive instruction.* Retrieved from http://www.centerii.org/handbook/Resources/7_C_Using_Student_Data.pdf.

Chenoweth, K. & Theokas, C. (2013). How high-poverty schools are getting it done. *Educational Leadership, 70*(7), 56-59.

Cody, A. (2013). Two ways to lead. *Educational Leadership, 71*(2), 68-71.

Cummings, K. (2014). An action plan for creating effective schools. *Association for Middle Level Education, 1*(6), 31-33.

Darnell, B. (2014). Listening to the data: Students are talking to you through their assessments. *Association for Middle Level Education, 1*(5), 10-13.

David, J. L. (2009). What research says about collaborative inquiry. *Educational Leadership, 66*(4), 87-88.

Doubet, K. J. (2011). Formative assessment: The driving force behind differentiation. *Middle Ground, 14*(3), 10-12.

DuFour, R. & Mattos, M. (2013). How do principals really improve schools? *Educational Leadership, 70*(7), 34-40.

Dyer, K. (2013, July 31). The importance of collaboration in teacher professional development. [Web log comment]. Retrieved from www.nwea.org/blog/2013/ the-importance-of-collaboration-in-teacher-professional-development/

Fenton, B. & Murphy, M. (2014). New leaders for new schools: Data-driven instruction. *Association for Supervision and Curriculum Development, 5.* Retrieved from www.ascd.org/ascd-express/vol5/508-fenton.aspx

Fernandez, G. (2012). Playing nice: How to collaborate effectively with colleagues. *Psychological Science Agenda.* Retrieved from www.apa.org/science/about/

psa/2012/10/effectively-collaborate.aspx

Hocket, J. A. & Doubet, K. J. (2014). Turning on the lights: What pre-assessments can do. *Educational Leadership, 71*(4). 50-54.

Hollins, E. R. (2006). Transforming practice in urban schools. *Educational Leadership, 63*(6), 48-52.

Jaquith, A. (2013). Instructional capacity: How to build it right. *Educational Leadership, 71*(2), 56-61.

Johnson, B. (2014). Making the most out of teacher collaboration. [Web log Comment]. Retrieved from www.edutopia.org/blog/teacher-teacher-collaboration-strategies-ben-johnson

Kohm, B. & Nance, B. (2009). Creating collaborative cultures. *Educational Leadership 67*(2). 67-72.

Leana, C. R. (2011). The missing link in school reform. *Stanford Social Innovation Review.* Retrieved from www.ssireview.org/articles/entry/the_missing_link_in_school_reform/

McClure, C. T. (2008). The benefits of teacher collaboration. *District Administration.* Retrieved from www.districtadministration.com/article/benefits-teacher Collaboration.

McLeod, S. (2005). *Data-driven teachers.* Retrieved from https://datacenter.spps.org/uploads/ThoughtLeaders_DDDM_May05.pdf

Moore, B. (2014). The four lenses of data. *Association for Middle Level Education, 1*(2). 14-16.

Morgan, J. (2013). The 12 habits of highly collaborative organizations. *Forbes.* Retrieved from www. forbes.com/sites/jacobmorgan/2013/07/30/the-12-habits-of-highly-collaborative-organizations/

National Association of Elementary School Principals (2011). *Using student achievement data to support instructional decision making.* Alexandria, VA. Retrieved from http://www.naesp.org/sites/default/files/Student%20 achievement_blue.pdf

Palmisano, M. (2012). Collaborative inquiry differs from traditional professional development. *Literacy in Learning Exchange.* Retrieved from www.literacyinlearningexchange.org/collaborative-inquiry-differs

Pollak, C. J. (2009). *Teacher empowerment and collaboration enhances student engagement in data-driven environments.* Retrieved from ERIC. (ED 505171)

Protheroe, N. (2009). Improving teaching and learning with data-based decisions: Asking the right questions and acting on the answers. *Educational Research Service.* Retrieved from www.lesn.appstate.edu/olson/RES5080/Components/ articles_used_in_5080/Pruthero Improving_teaching_and_learning_with_ databased_decisions.pdf

Ronka, D., Geier, R., & Marciniak, M. (2010). A practical framework for building a data-driven district or school: How a focus on data quality, capacity, and culture supports data-driven action to improve student outcomes. *A PCG White Paper.* Retrieved from www.publicconsultinggroup.com/news/post/ 2010/06/28/A-Practical-Framework-for-Building-a-Data-Driven-Actin-to-

Improve-Student-Outcomes.aspx

Secretariat. (2010). *Capacity building series.* Retrieved from http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/CBS_Collabotive_Teacher_Inquiry.pdf

Siedlecki, J. (2012, June 5). The five building blocks of data-informed instruction. [Web log comment]. Retrieved from www.msdf.org/blog/2012/06/the-five-building-blocks-of-data-informed-instruction/

Thompson, L. (2010). Principles of data-driven instruction. Retrieved from http://www.mhpdonline.com/leadership/pdfs/Principles_of_Data_Driven_instruction. pdf.

Waters, T., Cameron, G., McIver, M., Dean, C., Eck, J., Lyons, C., & Sussman, M. (2009). Balanced leadership: School level leadership participants manual. Colorado: McREL.

Wayman, J. C. (2005). Involving teachers in data-driven decision-making: Using computer data systems to support teacher inquiry and reflection. *Journal of Education for Students Placed at Risk, 10*(3), 295-308.

Wimberley, C. E. (2011). Teacher collaboration and student achievement. (Doctoral Dissertation). Retrieved from ProQuest Dissertations & Theses. (3490620)

TABLES

TABLE 1

Two-tailed t-Test at the a = .05 Level Evaluating Majority Students Mathematics Normal Curve Equivalency (NCE) Gains Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	*p*-Value
1	105	-0.50	13.09	0.49
2	110	-0.56	14.10	

* **Significant at** $p < .05$

TABLE 2

Two-Tailed t-Test at the a = .05 Level Evaluating Majority Students Reading Normal Curve Equivalency (NCE) Gains Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration More than Three Years

Elementary School	Participants	Mean	Standard Deviation	*p*-Value
1	105	1.62	13.59	0.24
2	110	0.38	11.62	

***Significant at** $p < .05$

TABLE 3

Two-Tailed t-Test at the Alpha a = .05 Level Evaluating Majority Students Mathematics Normal Curve Equivalency (NCE) Gains Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	Participants	Mean	Standard Deviation	*p*-Value
1	213	2.29	12.09	
				0.01*
2	162	-1.05	13.00	

*Significant at $p < 0.05$

Table 4

Two-Tailed t-Test at the a = .05 Level Evaluating Majority Students Reading Normal Curve Equivalency (NCE) Gains Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration More than Three Years

Middle School	Participants	Mean	Standard Deviation	p-Value
1	213	-1.47	12.20	
				0.78
2	162	-0.45	12.57	

*Significant at $p < .05$

Table 5

Two-Tailed t-Test at the a = .05 Level Evaluating Minority Students Mathematics Normal Curve Equivalency (NCE) Gains Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	p-Value
1	21	-7.29	10.11	
				0.95
2	26	-1.62	13.56	

*Significant at $p < .05$

Table 6

Two-tailed t-Test at the a = .05 level evaluating minority students Reading NCE gains comparing Elementary School 1, which has used data-driven collaboration less than three years, and Elementary School 2, which has used data-driven collaboration more than three years

Elementary School	Participants	Mean	Standard Deviation	p-Value
1	21	-5.43	14.73	
				0.72
2	26	-3.00	13.85	

*Significant at $p < .05$

Table 7

Two-Tailed t-Test at the a = .05 Level Evaluating Minority Students Mathematics Normal Curve Equivalency (NCE) Gains Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	**Participants**	**Mean**	**Standard Deviation**	***p*-Value**
1	225	0.58	13.13	0.06
2	225	-1.20	11.54	

*Significant at $p < .05$

Table 8

Two-Tailed t-Test at the a = .05 Level Evaluating Minority Students Reading Normal Curve Equivalency (NCE) Gains Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	**Participants**	**Mean**	**Standard Deviation**	***p*-Value**
1	225	-1.08	11.90	0.99
2	225	1.57	11.54	

*Significant at $p < .05$

Table 9

Two-Tailed t-Test at the a = .05 Level Evaluating Female Students Mathematics Normal Curve Equivalency (NCE) Gains Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	*p*-Value
1	63	-1.75	10.98	0.47
2	59	-1.92	11.34	

*Significant at $p < .05$

Table 10

Two-Tailed t-Test at the a = .05 Level Evaluating Female Students Reading Normal Curve Equivalency (NCE) Gains Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	p-Value
1	63	-1.60	13.39	0.44
2	59	-1.93	11.61	

*Significant at $p < .05$

Table 11

Two-Tailed t-Test at the a = .05 Level Evaluating Female Students Mathematics Normal Curve Equivalency (NCE) Gains Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	Participants	Mean	Standard Deviation	*p*-Value
1	207	3.03	12.94	
				0.01*
2	191	0.21	10.86	

*Significant at $p < .05$

Table 12

Two-Tailed t-Test at the a = .05 Level Evaluating Female Students Reading Normal Curve Equivalency (NCE) Gains Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	Participants	Mean	Standard Deviation	*p*-Value
1	206	-2.71	11.37	
				1.00
2	191	0.66	12.25	

*Significant at $p < .05$

Table 13

Two-Tailed t-Test at the a = .05 Level Evaluating Male Students Mathematics Normal Curve Equivalency (NCE) Gains Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	*p*-Value
1	63	-1.51	16.09	0.73
2	77	-0.17	14.38	

*Significant at $p < .05$

Table 14

Two-Tailed t-Test at the a = .05 Level Evaluating Male Students Reading Normal Curve Equivalency (NCE) Gains Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	*p*-Value
1	63	2.49	14.35	0.26
2	77	1.01	12.38	

*Significant at $p < .05$

Table 15

Two-tailed t-Test at the a = .05 level evaluating male students Math NCE gains comparing Middle School 1, which has used data-driven collaboration less than three years, and Middle School 2, which has used data-driven collaboration more than three years

Middle School	Participants	Mean	Standard Deviation	*p*-Value
1	233	-0.03	12.35	
				0.03*
2	196	-2.44	13.19	

*Significant at $p < .05$

Table 16

Two-Tailed t-Test at the a = .05 Level Evaluating Male Students Reading Normal Curve Equivalency (NCE) Gains Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	Participants	Mean	Standard Deviation	*p*-Value
1	232	0.01	12.47	
				0.75
2	196	0.79	11.80	

*Significant at $p < .05$

Table 17

Two-Tailed t-Test at the a = .05 Level Evaluating Economically Disadvantaged Students Mathematics Normal Curve Equivalency (NCE) Gain Scores Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	*p*-Value
1	25	-3.92	14.57	
				0.85*
2	57	-0.21	15.23	

*Significant at $p < .05$

Table 18

Two-Tailed t-Test at the a = .05 Level Evaluating Low Socio-Economic Students Reading Normal Curve Equivalency (NCE) Gain Scores comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	*p*-Value
1	25	1.04	15.54	
				0.15
2	57	-2.67	13.33	

*Significant at $p < .05$

Table 19

Two-Tailed t-Test at the a = .05 Level Evaluating Economically Disadvantaged Students Mathematics Normal Curve Equivalency (NCE) Gain Scores Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	Participants	Mean	Standard Deviation	*p*-Value
1	186	1.39	11.52	0.01*
2	172	-1.49	11.26	

*Significant at $p < .05$

Table 20

Two-Tailed t-Test at the a = .05 Level Evaluating Economically Disadvantaged Students Reading Normal Curve Equivalency (NCE) Gain Scores Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	Participants	Mean	Standard Deviation	*p*-Value
1	186	-0.98	11.17	0.98
2	172	1.45	11.29	

*Significant at $p < .05$

Table 21

Two-Tailed t-Test at the a = .05 Level Evaluating Non-Economically Disadvantaged Students Mathematics Normal Curve Equivalency (NCE) Gain Scores Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	*p*-Value
1	101	-1.06	13.52	
				0.48
2	79	-1.16	11.48	

*Significant at $p < .05$

Table 22

Two-Tailed t-Test at the a = .05 Level Evaluating Non-Economically Disadvantaged Students Reading Normal Curve Equivalency (NCE) Gain Scores Comparing Elementary School 1, which has used Data-Driven Collaboration less than Three Years, and Elementary School 2, which has used Data-Driven Collaboration more than Three Years

Elementary School	Participants	Mean	Standard Deviation	*p*-Value
1	101	0.30	13.64	
				0.74
2	79	1.47	10.88	

*Significant at $p < .05$

Table 23

Two-Tailed t-Test at the a = .05 Level Evaluating Non-Economically Disadvantaged Students' Mathematics Normal Curve Equivalency (NCE) Gain Scores Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	Participants	Mean	Standard Deviation	*p*-Value
1	252	1.42	13.45	
				0.03*
2	215	-0.85	12.84	

Significant at $p < .05$

Table 24

Two-Tailed t-Test at the a = .05 Level Evaluating Non Socio-Economic Students Reading Normal Curve Equivalency (NCE) Gain Scores Comparing Middle School 1, which has used Data-Driven Collaboration less than Three Years, and Middle School 2, which has used Data-Driven Collaboration more than Three Years

Middle School	Participants	Mean	Standard Deviation	*p*-Value
1	252	-1.48	12.65	
				0.92
2	215	0.14	12.55	

*Significant at $p < .05$

APPENDICES

Appendix A

Letter Asking for Permission to Conduct Research in the Clarksville-Montgomery County School System

February 17, 2014

Dr. Sallie Armstrong
Director of Curriculum
Clarksville-Montgomery County School System
621 Gracey Avenue
Clarksville, TN 37040

Dear Dr. Armstrong:

I am pursuing an Education Specialist Degree at Austin Peay State University. I am presently enrolled in Education 6050, Seminar on Research, and a requirement for completion of the course as well as the degree is the development of a proposal for research. This letter is a request for permission to conduct research using archival data from the Clarksville-Montgomery School System.

The challenge for all school systems including CMCSS is to find proven practices that close the gap between economically disadvantaged students and non-economically disadvantaged students in Reading and Math. The research study will be titled *The Effects of Data Driven Collaboration on Student Achievement*. I plan to use archival TCAP ACHIEVE proficiency and NCE gain score data from the beginning of each school's collaborative practices until 2013 if available. I also plan to interview the principals and/or academic coaches of the 4 chosen schools to determine the frequency and extent of the data driven collaboration.

I hope to answer the following questions:

1. What effect does data driven collaboration have on Reading TCAP ACHIEVE proficiency or NCE gain scores?
2. What effect does data driven collaboration have on Math TCAP ACHIEVE proficiency or NCE gain scores?
3. Does data driven collaboration have a greater impact on economically disadvantaged or non-economically disadvantaged students?
4. Does the frequency of data-driven collaboration have an effect on student achievement?

Thank you for consideration of my research proposal. I look forward to your response and recommendations.

Sincerely,

Kimberlee Taylor
Academic Coach
Northeast Middle School
Kimberlee.taylor@cmcss.net
931-648-5665, ext. 100

APPENDIX B

Permission to Conduct Research in the Clarksville-Montgomery County School System

From: Sallie Armstrong
Sent: Thursday, February 27, 2014 1:40 PM
To: Kimberlee Taylor
Cc: Leigh Ann Parr; Kimmie Sucharski
Subject: Research request

You have permission to conduct research in the district.

Sallie Armstrong, Ed.D.
Director of Curriculum and Instruction,
Curriculum and Instruction Department
Clarksville-Montgomery County School System

Office: 931-920-7819

Cell: 931-980-2637

Email: sallie.armstrong@cmcss.net

Appendix C

Institutional Review Board Letter of Approval

AUSTIN PEAY STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD

Date: 6/2/2014

RE: 14-028- The Impact of Data-Driven Collaboration on Student Academic Achievement in Math

Dear Kimberlee Taylor,

We appreciate your cooperation with the human research review process at Austin Peay State University.

This is to confirm that your research proposal has been reviewed and approved for exemption from further review. Exemption is granted under the Common Rule 45 CFR 46.101 (b) (4); the research involves only the study of existing data, the data is recorded in such a manner that the subjects cannot be identified directly or through identifiers.

You may conduct your study as described in your application, effective immediately. Please note that any changes to the study have the potential for changing the exempt status of your study, and must be promptly reported and approved by APIRB before continuing. Some changes may be approved by expedited review; others require full board review. If you have any questions or require further information, you can contact me by phone (931-221-6106) or email (shepherdo@apsu.edu).

Again, thank you for your cooperation with the APSU IRB and the human research review process.

Sincerely,

Omie Shepherd, Chair□Austin Peay Institutional Review Board

Cc: Dr. Gary Stewart

Omie Shepherd

Appendix D

Interview Questions

Interview Questions Used to Interview Academic Coaches

How often do teachers at your school collaborate?

If some teams collaborate more often than others, is there evidence of a difference in student learning? Explain.

Drawing from your experience, what makes one collaborative team more successful than another?

Describe a typical collaborative session.

How has collaboration changed at your school over the past three years?

To what extent do collaborative teams use data?

Do you feel teachers at your school use data with fidelity? Explain.

What is the biggest difference between teachers at your school that use data with fidelity and teachers who do not?

Based on data, do you think collaboration has a more positive effect on economically disadvantaged students compared to non-economically disadvantaged students? Explain.

Anything else you want to add: