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The Effect Of Academic Coaches On Teachers' Effective Use Of Data For Instructional Decisions

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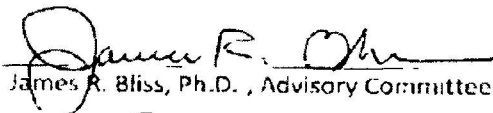
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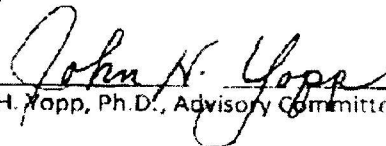Barbara Quillen Shoemaker

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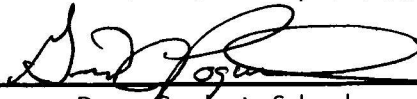Charles Hausman, Ph.D. Chair, Advisory Committee

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THE EFFECT OF ACADEMIC COACHES ON TEACHERS' EFFECTIVE USE OF DATA FOR INSTRUCTIONAL DECISIONS.

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DEDICATION

This dissertation is dedicated to loving husband, Martin, for his support through these years of coursework. To my children: Pete, Boolie and Virginia, who believed in me, and my grandchildren: Joey, Maya, Kasia, Sophie, Caroline and Cora, may you always ask many, many questions. It is also dedicated to my mentors who by their example inspired me to teach, Dr. Don B. Williams, Dr. John H. Yopp and Dr. Charles Hausman.

Finally, this paper is dedicated to my parents, W.P. (Pete) and Kitty Quillen who fostered the love of education for all of their four children.

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Abstract

One of the common themes in education reform is the use of data-driven decision making. The data provides the information we use to improve our knowledge of classroom instruction. Teachers need professional development to improve their ability to enable data driven decision-making. What data are available? What information can be gleaned from the data? What instructional changes based on data occur? Professional development, the nature of coaching, and their effect on teacher use of data have not been adequately treated in educational literature. This study will be based on an evaluation of an academic coaching project in a large urban area. The samples were extracted from existing data obtained by the school district based on an evaluation of the academic coaching program. All teachers in the elementary and middle schools were given the opportunity to participate in a survey. The data were gathered early in 2014 school term with 443 teachers responding. An Independent sample T-test was used to determine if there is a difference in working with a coach or not in the use of data. The question "Is there a correlation between the amount of time working with a coach and teacher's use of data?" used data from the internal evaluation by the school district. Bivariate correlations were ran for the factor teacher use of data with hours spent by a coach in their school and for teacher use of data with hours worked with a coach. Finally characteristics the study viewed the questions of what characteristics of a coach that could predict teacher use of data.

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CHAPTER I

INTRODUCTION

Educators have long been using data in various ways to make decisions about student achievement and instruction. In the past, data from summative tests was used as a "sorting machine" for decisions for who went to college, who would go into apprenticeships and who would start on the factory floor (Stiggins, R. 2006). Today, as technology has improved, data from various assessments are used to address individual learning styles and to aid in individualizing the curriculum to help children learn. As information from the data has increased, so has the need for professional development (PD) in data analysis and data literacy for teachers (Young, V, 2006). One avenue for receiving professional development is through academic coaches and embedded PD. This study will look at the relationship between teachers' effective use of data while working with academic coaches.

Teacher Accountability

The degree of accountability to which P12 schools are held has never been higher (Carlson, C., Turner, V. 2011). Schools are charged with creating outstanding citizens, and, if the graduates fail to meet all of the expectations of society such as student achievement, it is the fault of the schools. If preparedness of the workforce is lacking, it was because of lack of rigor in the schools. If ethics in the professions and workplace are weak, the schools have failed to provide the training. Education is, and

has been held responsible, for many societal woes that are as politically as educationally based.

The National Council on Teacher Quality (NCTQ) believes the teaching profession is "way overdue for significant reform in how we recruit, prepare, retain, and compensate teachers." NCTQ is a bipartisan reform effort based in Washington, D.C. and founded in 2000 to shape an agenda to improve the teaching profession. Recently, it released the *2013 State Teacher Policy Yearbook* report. The yearly report addresses specific goals that have been determined to build the successful framework for support of teacher effectiveness. NCTQ reports the progress made by individual states in five areas: delivering well prepared teachers, expanding the teacher pool, identifying effective teachers, retaining effective teachers and exiting ineffective teachers. The determination of what constitutes "effective teachers" requires teacher evaluations based on evidence of content knowledge, classroom observations, school level data on student performance, relationship between teacher compensation and teacher effectiveness and strengthening teacher preparation programs, including alternative certification programs. (May 2011 Recommendations for the Reauthorization of the Elementary and Secondary Education Act). One of the NCTQ recommendations is that tenure will be tied to the evidence of teacher effectiveness as well as license renewal. Teachers are responsible not just for teaching reading, writing and athematic; they are responsible for student data and their own performance data. The student data sets include non-academic data such as records of attendance, retention, dropout, and

graduation rates. These require attention as they have been shown to have an effect on student success and transition into adult life. Academic data include all scores of academic subjects through various assessments. The many assessments now given in the schools include classroom tests, state standardized tests, writing assessments, college entrance exams (starting in the 8th grade) and diagnostic tests (given to secure better scores on the state standardized tests). Teachers have not been prepared for this onset of data mania. Recently a teacher commented that "the new Common Core Standards were not a problem, but the assessments and data that comes with it will cause teachers to leave the classroom." (Davis, K.2013)

The school districts have been busy preparing teachers to use data with after school workshops, time on state websites, and the purchase of many new technological programs to aid in the collections, analysis, and reporting of data (Wayman,et al, 2009, Carlson & Turner, 2011) . Many of these programs offer diagnostic assessment to judge the success of students with various academic skills and offer the instructional avenue for his or her improvement. Yet even now most teachers are still not using the data for instructional purposes. The US Department of Education's report*, Implementing Data-Informed Decision Making in Schools—Teacher Access, Supports and Use* states:

> "Data from student data systems are being used in school improvement efforts but are having little effect on teachers' daily instructional decisions as evidenced in case study districts. Despite progress in giving teachers access to student data, it is clear that in many districts, the use of locally generated data to inform instruction is an activity separate from use of data systems containing student scores on standardized tests. District and school uses of data systems to store, organize and report standardized test scores typically focus on accountability concerns and on efforts to ensure that local

curriculum and instruction are well aligned with state assessments. Neither the type of assessment for which data are available nor the time frame of assessment activities serves the needs of classroom teachers making decisions on a daily basis. Case study schools did offer evidence that teachers and teacher teams were using data to guide classroom instruction, but these data generally came from assessments closely aligned with local instruction, and the data were typically not stored on the student data system containing state assessment scores. The integration of classroom and state assessment data in the same electronic system is not common, even in case study districts noted for their data systems and data-using culture." (p4)

The use of data as a tool for guiding instruction has been at best, based on teachers' own interpretation of the quizzes or tests developed by a textbook company or written by the teacher themselves. The use of data based on standardized assessment has not been a consideration for individual student learning, but as a classroom evaluation of what has been taught or taught sufficiently. With the emphasis on individual student success, some teachers are spending more time with individual scores from various resources. Cameron Carlson(date) states, "District-level expectations for data use have promoted one of two cultures – for "accountability" or for "organizational learning" – and rely upon principals to utilize data to guide action, provide enlightenment, and mobilize support (Firestone & González, 2007). Accountability cultures tend to use data as reactive measures and impose rewards and sanctions to achieve higher test scores; whereas, the organizational learning cultures tend to use data to diagnose problems and inform practice to achieve student and professional learning" (Carlson & Turner, 2011 pg3). Teachers 'effective use of data has been shown to have a positive effect on student improvement. (Kerr, Marsh, Ikemoto, Darilek and Barny, 2006). The daily use of data is an "effective way" for teachers to become aware of how data can help their instruction (Wayman, Lehr, Spring, Lemke, 2012).

History of Academic Data

The Elementary and Secondary Education Act (ESEA) was enacted in 1964. The

law specifically addressed K-12 education and equalization of education with

expectations of high standards. The original act included five titles, and including those

concerned with disadvantaged children. Over the past fifty years, the law has been

reauthorized and redesigned many times. During President Bill Clinton's tenure, the

ESEA went through another reauthorization, with a theme of "Goals 2000". The

reshaping of the law required states to establish education standards and a series of

accountability assessments to make sure the students had mastered these standards.

The role of the federal government in education in this era was changing; the role was

not just a distributor of mandates but became that of a regulatory agency for

accountability of student performance. The states were required to create a

"performance-based accountability" system with a public reporting system. During the

1990s another focus on education was created by the publication of "A Nation at Risk:

The Imperative for Educational Reform" report which stated American schools were

"tolerating mediocrity"

(http://datacenter.spps.org/uploads/SOTW_A_Nation_at_Risk_1983.pdf)

> "We report to the American people that while we can take justifiable
> pride in what our schools and colleges have historically accomplished and
> contributed to the United States and the well-being of its people, the
> educational foundations of our society are presently being eroded by a rising
> tide of mediocrity that threatens our very future as a Nation and a people. What
> was unimaginable a generation ago has begun to occur--others are matching and
> surpassing our educational attainments." (p 2)

The publication had the same effect on the educational system as did the launching of Sputnik in the 1950s. The country became alarmed about the lack of rigor in the US educational system.

No Child Left Behind (NCLB)

In 2002 the No Child Left Behind act was signed into law. NCLB rests on four principals: "increase accountability for student performance," "focus on what works," "reduce bureaucracy and increase flexibility," and "empower parents." (Knaak & Knaak, 2013) It should be noted here that the NCLB law gave guidelines for school improvement (and tied funding to its implementation) but it was up to the states, districts and schools to address specifics such as standards and assessment of those standards. The emphasis on teacher accountability took center stage. One of the most controversial pieces of the legislation is the "highly qualified teacher" (HQT) provision. Teachers have always been a focus of education reform, whether it was a teacher-shortage, a lack of adequate pre-service program or lack of content knowledge. Under NCLB, all teachers who teach the core academic subjects (English, reading/language arts, mathematics, science, foreign language, civics and government, economics, art, history and geography) must be highly qualified. (http://www2.ed.gov/policy/elsec/leg/esea02/index.html) All new elementary teachers are required to hold a bachelor's degree, a license from the state and pass a state test proving subject knowledge and teaching skill. All new middle school and high school teachers have to be concerned with the same issues and have a specific content area

major, such as mathematics or science. Educational aides (paraprofessionals) are

required to have at least two-years of post-secondary work or pass a rigorous state

assessment.

Common Core and Next Generation Science Standards

In 2010 an unprecedented 36 of 50 states and the District of Columbia have

adopted the Common Core Standards in language arts and mathematics (Porter,

McMaken, Hwang & Yang, 2011). Today, according to the Common Core State

Standards Initiative, forty-three states, as well as the District of Columbia, Guam,

American Samoa, US Virgin Islands and Northern Mariana Island have adopted the

Common Core State Standards (CCSS). (http://www.corestandards.org/standards-in-your-state/) The CCSS are designed to offer a focused, equitable and shared curriculum

for the country. At present, the states involved are implementing the CCSS and

providing training for teachers in mathematics and language arts (reading and literacy)

based on individual state plans. The new standards will also provide new assessments

based on two consortia, Partnership for Assessment of Readiness for College and

Careers (PARCC) an the Smarter Balanced Assessment Consortium (Smarter Balanced).

These assessments should be available during the 2014-2015 school year and offer

feedback for the student's success in mastery of the new benchmarks as compared to

other students in the country. Again states, have autonomy in the assessment decision.

(National Governors Association Center for Best Practices (NGA Center) and the Council

of Chief State School Officers (CCSSO), retrieved 2014)

The science was not to be outdone. The Next Generation Science Standards (NGSS) were developed and at this writing the NGSS website reports twenty-six states were involved with writing the standards but at present only 13 states have adopted the standards (http://ngss.nsta.org/about-the-next-generation-science-standards-2, retrieved August 20, 2014).   With the new standards and the new instructional strategies, assessment will be changing. The assessments will provide new sources of data for the teachers to utilize for improving instruction.

Disaggregated Data in Education

Meredith Honig and Cynthia Coburn in 2008 state, "Some funding streams also require school district central offices to collect and use school improvement plans as data to ground their decisions about professional development, textbooks, and other district matters." (Honig & Coburn, 2008). Due to NCLB, schools began looking at disaggregated data to track student performance. "School districts must also draw on such data to "analyze the causes of why individual students are not learning, identify barriers to learning that affects students, and seek solutions to correct the problem." (Honig & Coburn) Thus began education's determined move to data driven decisions. In *Linking Data and Learning – the Grow Network Study's* summary report, from the UCLA Center for Research on Evaluation, Standards and Student Testing (CRESST), it is stated that "Data-based decision-making and use of data for continuous improvement are the operating concepts of the day. School leaders are expected to chart the effectiveness of their strategies and use complex and often conflicting sate, district and local

assessments to monitor and assure progress." (Light, Hone, Heinze, Burnner, Wexler, Mandinach & Fasca 2005)

Data on student achievement and teacher performance have been, and are being, collected by educators for four principal stakeholders: federal agencies, state agencies, institutions/districts, and classrooms (Streifer & Schumann, 2009). The amount of data is massive with some of the information being stored in data-base format and some still stored in paper format. The data sets were/are not compatible and many times the same data were/are being duplicated. This is true for K-12 schools and institutions of higher education (IHE). Both are experiencing a surge of interest in developing or adapting programs for continuous improvement based on the analyses of these data sets. This scenario is improving with projects such as Kentucky Instructional Data System (KIDS) which was built to provide a technology infrastructure to "standardize and consolidate statewide data collection to provide greater accessibility of information to school communities, and more robust analytic capabilities for policy-makers and researchers." (Statewide Longitudinal Data System CFDA 84.372)

Technology and Teacher Training

The technology advancements supporting education over the past decade have been unprecedented. "Although schools have been "data rich" for years, they were also "information poor" because the vast amounts of available data they had were often stored in ways that were inaccessible to most practitioners." (Wayman, 2005, p296) The use of technology has allowed the secure storage of data and created accessibility

to those data sets for data mining purposes. (Using data mining techniques can allow the schools a representation of the totality of the student's school experience. One of the uses of these mined data is the school improvement plan process which are one of the first state mandates to insist that schools use data to determine needs and intervention plans. The assessments mentioned previously, as well as many other inputs such as student demographics, education nonacademic data, and a plethora of information collected by the school districts, provide more data than teachers have time to digest. Educators have long been using data in various ways to make decisions about students and instruction but this was historically mainly grades collected by individual teachers based on their individual instruction, assignments and assessments.

While the future pre-service teachers may find the use of technology second nature and may have received training on the collection and analysis of data, many of the in-service teachers may not have had the same opportunities or the needed skills to understand relevant data use. These teachers are now faced with learning the uses of technology as well as held accountable for results from assessments and data they have rarely seen in the past. Now it is up to the teacher to learn what data are available and how to translate it into useful information.

Academic Coaches

One of the most serious challenges to the teachers as an educational professionals is the accountability issues around assessment and the data the schools use to determine the teacher effectiveness. The challenges call for creative and

effective strategies to address teacher formation and professional development today.

The traditional strategies employed to enhance professional growth include training in

collaborative planning, reflectivity, professional growth practices, as well as examination

of certain personal characteristics. (Heltebran, 2008 p123) The better dynamic for use

for school districts is to move the data analysis process to an embedded part of

teaching. One approach to implement these strategies in school districts is the use of

academic or instructional coaches. "A coach supports a colleague's thinking, problem

solving and goal clarification. The outcomes of the coaching stance are to increase the

protégé's expertise in planning, reflecting on practice, and instructional decision-

making."(Lipton &Wellman, 2005 p25) "Coaches help teachers to reflect on their

practice—on what is going well and on what changes they should make" (Mednick, 2004

p3). The type of training has a definite impact on teachers. Below in Table 1-1, the

types of training and the relationship of their impact on teachers is demonstrated.

Table 1-1

Relationship of Impact on Teachers and the Types of Training Components Used

Training Components — Impact on Teachers	Understand Knowledge and Skills	Actually Learn Skills	Actually Apply Skills in Classroom
Presentation of Theory	85%	15%	5-10%
Modeling	85%	18%	5-10%
Practice and Low Risk Feedback	85%	80%	10-15%
Coaching Feedback Peer Visits	90%	90%	**80-90%**

(Joyce and Showers, 1995)

As seen in the table, the most effective staff development is through coaching with feedback. The application of skills leads to improved instruction and student learning.

Barriers to Effectively Using Data

One major factor that can account for the barriers of using data is the lack of specific training educators have in data analysis. A frequent complaint from in-service educators concern the lack of assessment/evaluation courses they had in their pre-service program. A second factor also mentioned by in-service teachers is the lack of time for proper "data reflection" (Personal communications from AMSP teachers as PEP/K12 Liaison). Rebecca Blink describes data reflections as one of the most critical components of the Data Driven Instructional System and the "most complex to organize and requires the biggest shift in district philosophy. …schools need to provide teachers not only with the tools they need to collect data but also with the time they need to analyze and interpret those data. Analyzing and interpreting data must become something that teachers and school personnel do every day in a data-driven school district because they believe it is the right thing to do to improve student achievement. No matter how the reflection takes place, formally or informally, teachers and administrators in data-driven districts are constantly reviewing their data and basing decisions on what they find." (Blink, 2006 pg. 39).

Types of Data Collected

Victoria Bernhardt (Bernhardt, 1998) created a model for the "multiple measures of data" collected by schools: demographics, perceptions, student learning and school process. Demographic data includes all of the enrollment, attendance, socio-economic, gender, grade-level, teachers, and ethnicity information on individual students. This data could be used for placement, course scheduling or remedial/enrichment placement. Student learning data includes all of the state assessments, grade-level assessment, and national assessments such as ACT, SAT, ASVAB, or NAEP. These sources are used for instructional processes in the school district. " In the case of assessment for learning, assessment becomes not only the measurer of impact, but also the innovation that causes in student achievement; assessment is not just the index of change, it is the change" (Stiggins et al. 2004 p 71)

School process data involves special programs implemented in schools, finance, transportation and professional development and teacher learning. This process data is important and rarely collected for analysis. Most programs are implemented until funding changes and rarely evaluated for success in improving student learning. Educators have an understanding of the responsibility for using assessment to provide opportunities. "…One is the opportunity to ask important questions about the value and effectiveness of our instructional programs. Another is the opportunity to engage in conversations about student learning with each other. The final opportunity is to use data about student learning to strengthen the way decisions

are made, leading to improvement in the curriculum and in instruction" (Huba and

Freed, 2000). "Certain data points may provide an awareness of a given situation… but

the data does not necessarily indicate how educators should address the issue at hand"

(Knapp, M. S., Swinnerton, J. A., Copland, M. A., & Monpas-Huber, J., 2006). The data

should be at the center of conversation, it should inform conversation but it does not

necessarily drive the decision of how best to improve student achievement.   Now

education leaders use data in a range of ways as described by Knapp, et al, 2006:

- Diagnosing or clarifying instructional or organizational problems (primarily internal to the decision-making group)
- Weighing alternative courses of action (primarily internal)
- Justifying chosen courses of action (primarily external)
- Complying with external request for information (external)
- Informing daily practices (internal)
- Managing meaning, culture, and motivation (internal)

"Data-informed leadership has changed." (Knapp, M., Copland, M. & Swinnerton, J.

2007) In the past leaders were worried about the bottom line, were the test scores up

and how much funding is available. Programs were decided on based on the funding

available or if the program came with funding. Leaders are worried about the "baloney

factor".   They have their ideas of what constitutes good teaching and what may be

missing from the formal or informal curriculum. Each school culture has desired ideals.

The conversation from effective teachers and leaders at the individual school can

address these ideals as they address needs.

Statement of research problem

Professional development, the nature of coaching, and their effect on teacher

use of data have not been adequately treated in educational research and its literature.

The focus of this research is on the collaboration of coaches with those coached and improved teachers' use of data to make decisions, concerning instructional strategies, choice of professional development, and improving student success. The concerns are the type of training teachers receive on data analysis, communication on data sources, and the use of data to analyze student needs. Formatively and summatively, teachers need to have access to assessment data and the time to study the information. There is often a disconnect between professional learning and use of data. "School districts must realize that professional learning does not drive change-student achievement drives change." (Blink pg.5) Too often teachers attend conferences and workshops, return to school trying to implement what has been learned, but not always successful.(Weiss & Pasley, Smith & Gillespe,) Reflection on the data for individual teachers will provide appropriate and needed professional learning each teacher may need. Also an exploration of the interaction between the types of "professional development" through coaching and the teachers that receive the service is a necessary issue to research.

Purpose of Study

The purpose of this study is to view the relationships between academic coaches and teachers with regard to their use of data in the schools. The study will look at the data driven decisions process provided by academic coaches and the transference of these processes to teachers through their collaborative interactions. This study ideally will lead to a greater understanding of the types of interactions as well as the models of

practice that most impact positive teacher growth, in this critical area of data use for

greater student achievement.

Significance of the research

There have been studies on academic coaches and their training, including their

success or failure, but there have been few studies about the active nature of the

interactions between the coaches that lead to the teachers' effective use of data

analysis. Such a study would reveal some of the key attitudes, environments, and

activities that support peer professional growth for both the teacher and the academic

coach. Garret states "…there is a clear need for new, systemic research on the

effectiveness of alternative strategies for professional development." (p918) He quotes

the National Research Council's position which argues that:

"Research studies are needed to determine the efficacy of various types
of professional development activities, including pre-service and in-service
seminars, workshops, and summer institutes. Studies should include
professional development activities that are extended over time and across
broad teacher learning communities in order to identify the processed and
mechanisms that contribute to the development of teachers' learning
communities". (Bransford, Brown, & Cocking, 1999, p 240)

More recent implemented teacher evaluation processes (Derrington, 2011)

provide the teacher with a "growth plan". This individualized method of professional

development is (should be) specific. The schools cannot afford the cost of every teacher

receiving the individualized training needed to address the many requirements expected

in the new education standards such as the Common Core Standards and the Next

Generation Science Standards. Academic coaches could provide the professional

development (e.g. embedded professional growth) as well as serve as a resource for research-based instructional strategies, data analysis and support of the teachers' reform effort. This is why best practices for the interactions between coaches and teachers are important to research.

Research questions

1. Is there a difference in use of data between teachers who worked with a coach and teachers who did not?

2. Is there a correlation between the amount of time working with a coach and teacher's use of data?

3. To what extent does the practices of academic coaches predict the teacher's use of data?

Research Design

The design of this study is to provide a means of learning about the implementation and impact of a reform effort utilizing academic coaches to analyse data by educators, specifically K-6 teachers. The large urban school district studied has been implementing an Academic Coaching program for the past three years. As part of an ongoing evaluation of the program, the district has agreed to share the data from the evaluation. A quantitative and qualitative study of a group teachers and coaches in large urban school district will provide data gathered through survey questions developed from the literature on coaching, use of data, teacher efficacy and the strategies to improve teacher growth. The study will utilize survey questions on teachers' use of data. The questions chosen were based on academic coaches and

teachers are correlated to strategies for implementing data use in schools. The survey

instrument also collects demographic data. The purpose is not to validate the programs

but rather to produce insights for those school districts engaging in similar reform

efforts utilizing the coaching approach. The study will also do an analysis on student

achievement of the teachers based on their involvement with academic coaches.

The study is based on the following concept map, Table 1-2. The map demonstrates the

problem, intervention needed and the outcomes, with the ultimate outcome improved

Table 1-2 Concept Map of Study

student learning. This research

will concentrate on the two

middle concepts, professional

coaching through academic

coaching and the improved use

of data by teachers who have

been coached.

Teacher's are not using data to address needs and changes in classroom instruction

Professional Development through academic coaching to improve teacher's understanding of use of data

Teachers use of data to improve classroom instruction

Improved Student Achievement

Limitations

This study is limited to the data collected on the teachers' self- reporting use

of data based on their interactions with academic coaches. The study is also limited to

an urban school district and recognizes the individual state have individual governing

and funding of school districts as well as individual districts have the same individual

constraints. This study was conducted during one school year midst a state wide change in curriculum and standardized assessment.

Definition of Terms

In the discussions to follow, the roles of <u>Academic coaching</u> should not be confused with those of mentors or recovery teachers. Across the country, there are teachers providing support and resources to their colleagues with various titles including math coach, teacher leader, master teacher, lead teacher, teacher facilitator, and the list goes on. (Killion, J. 2009) For this study an academic or instructional coach is a support teacher with release time to provide high quality teaching in content areas of literacy. The support efforts include modelling instructional strategies, content studies, collaborative lesson planning. The model provides job-embedded, individualized professional development. It should be noted here that the collaboration between the academic coach and teacher are reciprocal with both receiving growth from the collaboration. A further look at the various coaching approaches can be found in a table in Appendix B (Denton & Hasbrouck, 2009)

Mentoring and coaching are distinctly different activities but share similar goals. The latter includes both activities about "supporting individuals". Both play a major role in professional growth. Hadden (1997) describes coaching as "the discussion process between two partners aimed at exerting a positive influence. Since coaching is a critical part of mentoring, an effective mentor will have well-developed coaching skills" (p. 17). In the past, coaching has focused mostly on increasing the competence of

employees. Recent research, however, shows competence is strengthened by adding

the objective of building mutual commitment of the employee, assuming that the coach

and the employee are engaged in co-learning (Chawla & Renesch, 1995) (Kutilek &

Earnest, 2001) Mentoring includes coaching skills but adds elements having more

experience than a peer model. Mentors are advocates and role models. The

relationship is more of expert and a protégé, rather than a peer individual. Recovery

teachers are concerned with student recovery and assist teachers with specific

individualized programs. Academic data are multiple data sources found in K-12

education. The sources include, but are not limited, to students' assessments scores,

non-academic such as demographic data, dropout rates, daily attendance rates, teacher

certifications, years of service of teachers, and finally attitudinal surveys from students,

teachers, parents and stakeholders. The sources for the data may be derived from

formative or summative assessments. Formative assessments are those instruments or

activities that provide information on student learning. Summative assessment refers to

a test or an authentic assessment at the end of a unit or school term that relates the

success or reaching a set standard or benchmark.

Data decision making is the process upon where data from various inputs

and outcomes are transformed into information via analysis. (Kerr, et al, 2006). This

information is then viewed by individuals with "expertise to create actionable

knowledge". This knowledge is applied to support different decisions for the

improvement of student learning or district needs.

<u>Professional development</u> (PD) and professional growth are not synonymous. Professional growth is the increase of a teachers' knowledge and understanding of their practice, their profession. Elements of PD include teacher content knowledge, pedagogical content knowledge, and data analytical skills. Professional development also is the on-going training of in-service teachers, teachers who have completed a certification program and are employed as faculty by a school district. The majority of school districts require PD as part of the teacher's contract. These days may be chosen by individuals or by the school district varying on school district policy.

Summary

In the past, data from summative tests was used as a "sorting machine" for decisions for who went to college, who would go into apprenticeships and who would start on the factory floor (Stiggins, R. 2006). Today, as technology has improved, data from various assessments are used to address individual learning styles and to aid in individualizing the curriculum to help children learn. As information from the data has increased, so has the need for professional development (PD) in data analysis and data literacy for teachers (Young, V, 2006). One avenue for receiving professional development is through academic coaches and embedded PD. Professional development and the nature of academic and instructional coaching and its effect on teacher professionalism have not been adequately treated in educational research and its literature. For this study an academic or instructional coach is a support teacher with release time to

provide high quality teaching in content areas of literacy. The support efforts include

modelling instructional strategies, content studies, collaborative lesson planning.

CHAPTER II

Literature Review

Teachers' Use of Data Improves Student Achievement

Since NCLB has created the need to effectively use data to improve instruction,

school districts and their use of data have been the focus of many studies. *Linking Data*

and Learning – the Grow Network Study's (Brunner et al., 2005) describes a framework

for data-driven decision making to improve student achievement:

> "According to Ackoff (1989), data, information, and knowledge form a continuum that can be applied to make decisions. Data exist in a raw state. They do not have meaning in and of itself, and therefore, can exist in any form, usable or not. Whether or not data becomes information depends on the understanding of the person looking at the data. Information is data that is given meaning when connected to a context. It is data used to comprehend and organize our environment, unveiling an understanding of relations between data and context. Alone, however, it does not carry any implications for further action. Knowledge is the collection of information deemed useful, and eventually used to guide action." (Brunner, C. et al, 2005)

The process can be seen in a linear model as in Table 2-1 below,

constructing evidence that is sense making to individuals (Spillane, J. and Miele, D,

2005).

Table 2-1 Linear Model of Using Data for Action
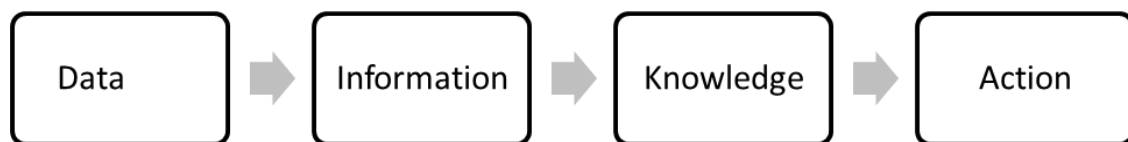
The data provides the information we use to improve our knowledge of classroom instruction. The knowledge will provide the appropriate actions for improved learning. The data can be seen as the "stimuli …selected from the environment before they can be interpreted. Thus, we begin by considering how people attend to objects and events in their environment and then go on to examine how they interpret this newly acquired information as evidence for or against a particular set of beliefs" (Spillane, Reiser & Reimer, 2002). The school districts often give selective attention when addressing the data. School district personnel draw from their personal experiences to form conclusions. Data can be used to justify their ideas. Practioners continually make use of "personal data" (i.e., information drawn from personal experience) to make sense of things" (Spillane & Miele, 2005). It is as if there is not a process in place for transferring the data into information to create the knowledge of what classroom instruction is successful for student improvement.

Data Driven Decision Making

One of the common themes in education reform is the use of data-driven decision making. Kerr states "The current high-stakes accountability environment brought on by the federal No Child Left Behind legislation places great pressure on districts and schools by requiring them to monitor student progress toward standards and holding them accountable for improvement." (Kerr p 496, 2006).   This high-stake accountability environment is based on the data generated by standardized assessments (administered by the individual states department of education) and thus

begins the road to data literacy for teachers and educators. The various State

Departments of Education have also implemented statewide longitudinal data systems

to track student achievement. (https://nces.ed.gov/programs/slds/) More recently local

school districts use of the data as a component of a teacher's evaluation make data

literacy more personally important to classroom teachers (Danielson & McGreal, 2000).

One recent report by Wayman et al., 2012, offers the following 13 principal strategies as

effective for leading faculty for effective data use:

> **"Asking the right question** of the data to remain focus on specific problems.
> **Communication** not only helps to retain focus but also help create an non-threatening environment.
> **Data System Support** a user friendly support system assist in bringing data to a teachers' classroom or home.
> **Distributed Leadership** the use of support staff, such as coaches, not only aid in a more effective campus wide use of data, but also provide the administrator with barriers and successes the teachers have in their data use practice.
> **Embedding Data into Everyday Work** will provide an improved frequency of teachers' use of data, therefore improving their skills and confidence in the use of data.
> **Engaging in Personal Learning Opportunities** will provide the principals and administrators themselves the opportunity to improve their own data skills and be able to improve modeling efforts.
> **Ensuring Adequate Professional Learning Opportunities** is key for improving one's skills and knowledge. Structuring and supporting small learning communities or relating relevant data use to teachers improve their practice of data use.
> **Facilitating Collaboration around Data** is a critical element in change of practice and effect professional learning. It also aids in creating a district wide vision for using data.
> **Focus Data Use on a Larger Context** rather than solely concentrate on state testing. Triangulation of various data sources utilized by teachers places the focus on a larger context of student learning, the "whole picture".
> **Fostering Common Understanding** and a shared vision of how data can improve student learning provides a better collaborative environment and "streamlines" the process.
> **Goal-Setting** creates a focus that is not too large or too small and puts the goals in an attainable benchmark. The goals also assist in specifying the data needed.

Modeling Data Use improves the staff's understanding of what and how data is used to address needs. Principals, administrators or academic coaches provide examples of data use by modeling the process daily.
Structuring the Time to Use Data is a main concern. This barrier is a threat to the data use process. Staff meeting, department meetings or PDs have to reshape their agendas to include time for effective data use. Time has to be adjusted around daily activities to provide data use time with specific expectations of outcomes from the sessions."

These strategies provide the basis for the teachers to be able to use data, but other factors may interfere with data decision making.

Barriers for Teachers Effectively Using Data

There are factors that present barriers for the effective use of data in decision making. They include lack of training in the use of data, availability of data, and time issues. These include lack of time for: analysis of data, reflection on information created from analysis and collaboration with colleagues and stakeholders. (Personal communication with AMSP teachers as PEP/K12 Liaison).

Data storage and availability have greatly improved but still offer obstacles for classroom teachers. State assessment data is released during the summer or the fall school year in some states. The analysis of this data could be used as professional development opportunities during the summer. If the data is not available to the teachers until fall term, it is hard to (1) use the data to plan a school year which has already began and (2) find time to view and adequately analyze the data.

The second issue with time constraints concerns a teacher's day, specifically their instructional time during the school day (Seiler et al., 2010). The complexity of

activities and interactions a teacher will be involved with in a singular day is astonishing

(Christopher, Pam, Gordon, & Alison, 2007)

"Teacher anxiety is an inverse indicator of efficacy (Aydin, Uzuntiryaki, &

Demirdogen, 2011) and commonplace in teachers faced with DDDM (Data Driven

Decision Making) reform efforts (Samuel, 2008); thus, it was examined as a component

of DDDM efficacy. DDDM anxiety was defined as the worry, tension, and apprehension

teachers feel about engaging in DDDM (Dunn et al., 2011). Teacher concerns refer to

one's set of thoughts and feelings about an innovation that include perceptions,

preoccupations, considerations, contentment, and frustration (Hall & Hord, 2011)"

(Dunn, K, et al. 2011). Teacher concerns are related to teacher efficacy. The changes

brought with the NCLB legislation, the adoption of new state standards (Common Core),

and the assessment of the new standards, have created many concerns and anxieties

for teachers. The relationship between innovation and implementation of the new

curriculum could impact teacher efficacy with data use as well as other efficacy issues.

The extent of the effect of teacher efficacy in use of data on collaboration can be seen in

Dunn's research:

> "We hypothesized that teachers' sense of efficacy for foundational aspects of DDDM (i.e., identifying and accessing data; using data tools and technology) and DDDM anxiety would significantly influence teachers' DDDM efficacy, which would, in turn, influence teachers' collaboration concerns about DDDM. It was subsequently hypothesized that teachers; collaboration concerns would significantly influence teachers' refocusing concerns about DDDM. This initial proposed model was validated in this study and offered new insight to efficacy and concerns literature, and more important, into the change process associated with teacher adoption of DDDM."

The change process, the concerns and teacher efficacy have created an implementation nightmare for school districts. The rapid changes in education have increased PD programs offered during their holidays or summer break and now even during school hours. Instead of missing school class time or personal time, teachers request embedded PD. Studies show that teacher efficacy, instructional efficacy and student learning improved with the implementation of academic coaching. (Ross, 1996, Shidler, 2009, Tschannena-Morean, et al, 2001.)

The emphasis on improving education increasingly falls on the subject of enhancing the quality of teachers. To improve educational outcomes, scholars and funding agencies are focusing on professional development. For years research efforts were on school expenditures, teacher salaries, or pupil-teacher ratios on student outcomes, but recent work demonstrates that the quality of teachers is a significant factor in explaining student achievement (Hanushek & Kain, 2005). Educators in Pre-K through 12 grades are both pre-service teachers and in-service teachers. Pre-service teachers are those who have not completed the certification program and are still preparing to receive credentials to teach in a public school system. In-service teachers are those who have completed a certification program and are employed in a public school system with a teaching assignment. The in-service teachers address educational changes and improvement through professional development (PD) programs. "While different methods of recruitment and training of teachers may affect the quality of teachers in the future, professional development programs focus on changing teacher

quality and student achievement of those teachers currently in the classroom" (Barrett, Toma et al, 2011).

Professional development has undergone changes (Weiss & Pasley, 2009) but unlike the growing literature on the relationship between pre-service training and student achievement (Harris and Sass, 2008), the effectiveness of professional development in influencing in-service teacher quality and, consequently, influencing student learning has received less attention. The results of PD is complicated by the fact that teachers, unless it is a school-wide PD program, voluntarily choose to participate in activities. Also, teachers receive varies types of PD throughout the school year with little evaluation on specific PD with student achievement. It is a smorgasbord of PD opportunity with a "hit or miss" philosophy of delivery. (Weiss & Pasley, 2009). The PD is rarely followed up with supporting programs. Therefore is has been hard for evaluative purposes to find what specific PD has made a difference.

The ultimate goal of PD is to improve student achievement. The National Staff Development Council's *Standards for Staff Development, Revised Edition* (2001) list the twelve standards below as necessary elements of professional development also referred to as staff development (*Teacher Professional Development: It's Not an Event, It's a Process*, 2003). These are provided in the following Table 2-2 and are self-explanatory.

Table 2-2 Standards For Staff Development	
Context **Standards**	**LEARNING COMMUNITIES**: Staff development that improves the learning of all students organizes adults into learning communities whose goals are aligned with those of the school and district. **LEADERSHIP**: Staff development that improves the learning of all students requires skillful school and district leaders who guide continuous instructional improvement. **RESOURCES**: Staff development that improves the learning of all students requires resources to support adult learning and collaboration.
Process **Standards**	**DATA-DRIVEN**: Staff development that improves the learning of all students uses disaggregated student data to determine adult learning priorities, monitor progress, and help sustain continuous improvement. **EVALUATION**: Staff development that improves the learning of all students uses multiple sources of information to guide improvement and demonstrate its impact. **RESEARCH-BASED**: Staff development that improves the learning of all students prepares educators to apply research to decision making. **DESIGN**: Staff development that improves the learning of all students uses learning strategies appropriate to the intended goal. **LEARNING**: Staff development that improves the learning of all students applies knowledge about human learning and change. **COLLABORATION**: Staff development that improves the learning of all students provides educators with the knowledge and skills to collaborate.
Content	**EQUITY**: Staff development that improves the learning of all students prepares educators to understand and appreciate all students, create safe, orderly and supportive learning environments, and hold high expectations for their academic achievement. **QUALITY TEACHING**: Staff development that improves the learning of all students deepens educators'content knowledge, provides them with research-based instructional strategies to assist students in meeting rigorous academic standards, and prepares them to use various types of classroom assessments appropriately. **FAMILY INVOLVEMENT**: Staff development that improves the learning of all students provides educators with knowledge and skills to involve families and other stakeholders appropriately.

State certification programs require continuous professional development. Barrett,et al

(2012) remark

"The literature finds quite clearly that teacher quality is an important ingredient in student learning outcomes. At this point in time, however, the literature is less clear on exactly how to create higher teacher quality through training programs either at the pre-service or in-service stages of teacher development. The literature also illustrates that one of the real challenges of identifying programs that might enhance teacher quality is the myriad of complicating factors that enter into estimating the effects of a particular attribute or a particular aspect of teacher quality. The research on PD programs has suffered because of more practical problems as well. Many PD programs have minimal "dosage." The programs sometimes constitute a few hours of a day or a weekend. Most of the programs do not collect data that are conducive to analysis of PD treatment effects. Finally, and very important, with the exception of the few studies identified above, almost no studies of PD effects have included student learning effects. …"There is a large and evolving literature on understanding pre-service factors that contribute to higher quality teachers. While the literature now verifies that teacher quality is important, measurable attributes of teacher quality remain hard to define. For example, years of experience, the quality of the teachers' institution of training as well as the teachers' type of certification (traditional or alternative) have been found to have some effect on student outcomes and also have been found to have no effect (Barrett, Butler, & Toma, 2012)."

This study will concentrate on the process standards mentioned in the table and specifically of: data driven decision making, design, learning and collaboration. The specific design mechanism is the *embedded style of academic coaching*.

Academic Coaching

Academic coaching is a delivery mechanism for professional development. "The American Federation of Teachers has defined professional development as a continuous process of individual and collective examination and improvement of practice designed to empower educators ''to make complex decisions; to identify and solve problems; and to connect theory, practice, and student outcomes'' (American Federation of Teachers, 2002, p. 4)."(Denton, et al, pg151). The professional development in the past has been

addressed in two traits, (1) dissemination of new ideas through modeling the

information or (2) lecture format, seven hours of listening to how the innovations are to

be implemented (Abilock, Harada, & Fontichiaro, 2013). "The most effective schools

have coaches. They meet with the principal on a regular basis to assess the progress of

every teacher and student. In an effective school, everyone functions as a team and

there is a laser focus on student achievement."(Wong & Wong, 2008)

There are many venues to the delivery of PD, but the design of the program

has become as individualized as the districts themselves. "Effective professional

development ….occurs onsite as close to the very classrooms where it is to be

employed." (Shidler, 2009) Effective PD is training and reinforcing researched-based

practices new to teachers and engages the teacher. Teachers need to move through this

process in their own pace; being allowed to learn, retrain and have guided practice.

Coaches assist teachers in this process. (Shidler, 2009) The complexity of planning PD

has also created the problem of mass production…new teachers need different levels of

information from veteran teachers. (Weiss& Paisley, 2009) Or the new teachers may be

bored with a technology workshop that is tailored to the veteran teacher who just

received their first tablet. Such disconnected programs laid the ground for the academic

coaches,

> "During the 1970s and 1980s, researchers and educators expressed
> dissatisfaction with the typical fragmented workshop form of professional
> development for teachers and began to call for more long-term, job-embedded
> approaches to improving teacher practice (cf., Showers, Joyce, & Bennett, 1987).
> Bruce Joyce and Beverly Showers were leaders in the development of coaching

models, beginning in the late 1970s and early 1980s. In one publication from this period, Joyce and Showers (1981) described the potential of coaching as a vehicle to transfer knowledge and skills learned by teachers in professional development into classroom practice. Research conducted by this team during the 1980s indicated that attending weekly seminars, or "coaching sessions" increased the implementation of new instructional approaches by teachers…". (Denton and Hasbrouck, 2009)

A collegial-based approach, the embedded PD program, offers an individualized instructional model. The new-found popularity of this model began with the *Reading First* projects. Academic coaches are usually veteran teachers with training in particular disciplines, such as reading. These coaches participate in instructional and leadership training as well as attending training for disciplines they address in the classrooms. (Knight (2008), Hall & Yoens (2007), Denton & Hasbrouck (2009).

The literature on academic coaches list many attributes, but also complaints and unknowns. Academic coaches who have good communication with the teachers are reported to have assisted teachers on improved student learning (Garet,et al., 2001). The research on the change of literacy instruction shows a link between coaching and the teachers' instruction. (Neuman & Cunningham, 2009). Indeed, there is a correlation between changes in instructional strategies of teachers who have a relationship with their academic coach (Neumerski, 2012).

The time spent between the coach and the teachers varies, but these interactions and the type of activity determines the outcome of the relationship.(Toll & Knight, 2008) Academic Coaches spend time with teachers in a diverse set of activities such as: co-teaching, observing, planning, providing resources, lesson development, co-

planning, and other supportive endeavors. (Wong & Wong, 2008) Academic coaches

also attend conferences and workshops to improve their own skill set and knowledge

base. Academic coaches also deliver PD for larger audiences in occasional school wide

programs. Academic coaches are considered "in-house" experts and with the rising cost

of consultants, the schools can provide programs without the extra cost. Unfortunately,

this can also be a negative happenstance, because of attitudes of teachers who may feel

their peers are not as helpful as a paid consultant(Denton & Hasbrouck, 2009).

One of the complaints found in the literature refers to the amount of

administrative work academic coaches become involved in. Although the time spent in

interaction and the work with the district is important, the academic coach can be seen

as an administrative mechanism in the school district and loose the trust and peer

status. If the school district operated on a shared vision and promoted distributed

leadership where all faculty and staff's voices were heard, this did not resonate as an

issue. (Kerr, K.A. et al, 2006) The major problem in this situation was the lack of time

the Academic coach had to work with classroom teachers.

It can be seen from the survey of literature that there is still a need to study the

effects of academic coaching. Some of the reasons for this need are more apparent.

Results on student achievement are mixed the first year of coaching, but seem to

improve the second and third years (Marsh, McCombs, & Martorell, 2010). The teachers

also receive other forms of PD during the school year due to the teacher contracts

expectations of a specific set of days or hours spent above their classroom attendance.

The various types of academic coaching and the diverse types of activities are difficult to evaluate. Denton and Hasbrouck have developed a comparison of Major Coaching Approaches and Two Consultation Models (see Appendix B). The table in this demonstrates the extended range of academic coaches and coaching activities that challenge the research questions of this study. Table 1 is the comparison of Major Coaching Approaches and Two Consultation Models describes the application of the coaching technique, its' purpose and role as well as the activities associated with said role.

Summary

One of the common themes in education reform is the use of data-driven decision making. The data provides the information we use to improve our knowledge of classroom instruction. The knowledge will provide the appropriate actions for improved learning. The emphasis on improving education increasingly falls on the subject of enhancing the quality of teachers. To improve educational outcomes, scholars and funding agencies are focusing on professional development. The rapid changes in education have increased PD programs offered during their holidays or summer break and now even during school hours. Instead of missing school class time or personal time, teachers request embedded PD. There are many venues to the delivery of PD, but the design of the program has become as individualized as the districts themselves. "Effective professional development ....occurs onsite as close to the very classrooms where it is to be employed" (Shidler, 2009). Effective PD is training and reinforcing

researched-based practices new to teachers and engages the teacher. Teachers need to

move through this process in their own pace; being allowed to learn, retrain and have

guided practice. Coaches assist teachers in this process. Studies show that teacher

efficacy, instructional efficacy and student learning improved with the implementation

of academic coaching. (Ross, 1996, Shidler,2009, Tschannena-Morean, et al., 2001.)

CHAPTER III

Methodology

This chapter will describe the methods and procedures used, including research design, research questions, and sample population to be used for this study.   As described in Chapter one, the purpose of this study is to discover the effects of academic coaching on teachers' use of academic data to make academic decisions. Utilizing the literature review on teacher's use of data, the study will consider teachers' perception of their own data use within the context of collaborating with academic coaches. A quantitative design has been developed to answer the research questions:

1. Is there a difference in use of data between teachers who worked with a coach and teachers who did not?

2. Is there a correlation between the amount of time working with a coach and teacher's use of data?

3. To what extent does the practices of academic coaches predict the teacher's use of data?

Context of the Study

Setting

The school district to be studied is located in large, urban, Mountain West community of 189,314 which lies within a metropolitan area with a population over 1,175,905. The city encompasses over 110 square miles. The city has experienced an

increase in population of 1.5% from 2010 to 2012. The median cost of a home in the city

is almost $240,000. While almost 22.5% of the population is under 18 years of age, only

9.4% of the population is over 65 years of age. According to the most recent Quick Facts

from the US Census Bureau, the reported majority ethnic background of the population

is White (75.1%). Minority populations include: Blacks (2.7%), American Indian and

Alaskan Native (1.2%), Asian (4.4%), Native Hawaiian/Pacific Islander (2%), and Hispanic

(22.3%), with some groups reporting two or more races.

The School District

For the 2011-2012 school year, the district had over 25,000 students enrolled in

grades K through 12 in 45 schools; 30 of these are elementary schools and 6 are middle

schools. The district employs more than 1,154 certified teachers. The student teacher

ratio is 21.6:1. The per-pupil expenditure in 2012 was $9,927 per student. Table 3-1

details the ethnicity distribution of the student population for grades Pre-K through 12.

Table 3-1 District-wide Elementary/Middle School Race/Ethnicity Report (2012)

	African American	Asian	Caucasian	Hispanic	Native American Indian	Pacific Islander	Multi
Elementary School	536/4%	519/4%	5915/43%	5718/42%	164/1%	478/3%	397/3%
Middle School	155/5%	102/3%	1187/37%	1441/45%	49/2%	146/5%	89/3%

Student demographics from the *Selected Social Characteristics in the United States*

2008-2012 American Commuinty Survey 5year Estimates indicate that students are

evenly distributed between female and male. Thirty-one percent (31.6%) of students

reside with both parents, while 78.1% of the students reside in a single parent household. One growing statistic is the number of grandparents responsible for their grandchildren, 18,460 or 33%. Almost 61% of the students are economically disadvantaged, as identified through eligibility for free or reduced priced lunch. Over 54% of the students represent ethnic minority populations, and almost 12% of the students participate in special education programs as identified by their Individual Education Plan (IEP)

Teacher Sample and Demographics

The survey data contains the teacher sample size and demographics. Specific demographic information will be taken from the survey for the research. The National Center for Education Statistics (NCES) reports for the 2011-2012 school year a total teacher population of 1,154 and a total staff of 2,604. The following Table 3-2 gives the number teachers per

Table 3-2 Teachers and Staff Per School

Teachers (FTE)	
Total:	**1,154.82**
Prekindergarten:	7.50
Kindergarten:	86.66
Elementary:	508.44
Secondary:	415.25
Ungraded:	136.97
Total Staff (FTE): 2,604.35	

school level. The numbers do not give the number of teachers per middle school as the district does have a PreK-8 school. The survey data will also contain the level of teacher education attainment, their ethnicity and years taught.

Description of Academic Coaching and Teacher Sample

The sample from the school district includes elementary and middle school teachers. These teachers represent 27 elementary schools and 5 middle schools. There are 13 Language Arts, 14 Math and 2 Special Education Coaches. They report directly to a supervisor for each content area, who reports to the Director of Professional Development. They receive PD provided centrally that focuses on such topics as adult learning, content expertise, the Common Core, assessment, use of data, and modeling. Coaches are housed in schools. They may be assigned to a school .2, .5 or 1 FTE. Their role is developmental and is not part of the teacher evaluation process. They work with teachers 1 on 1, in grade levels, departments, PLCs and whole schools. The samples will be extracted from existing data obtained by the school district based on an evaluation conducted of the academic coaching program. All teachers in the elementary and middle schools were given the opportunity to participate in a survey. The data were gathered early in 2014 school term with 443 teachers responding.

The evaluation of the coaching program involved qualitative as well as quantitative designs. This study will focus on the quantitative data gathered through a final evaluation survey and will only address eight questions from the survey. The eight questions relate to the teachers and their use of data based on their interactions with the coaches. The prompt for the questions states: "Please rate how working with the Language Arts, Math or SPED coaches have influenced you as a teacher. Please choose the one best response on your answer document." The Likert scale included: 1=Strongly

Disagree, 2=Disagree, 3=Agree, 4=Strongly Agree, 5=N/A or Unknown. The specific

statements from the survey for this study include:

47. I feel more confident with the use of data to inform my instruction.
48. I am able to take time to reflect on data.
51. I use data to identify specific areas in which I can improve my instruction.
52. I evaluate student work more effectively.
53. When I use data, I am more able to get through to even the most difficult or unmotivated students.
54. My understanding of state assessments has improved.
55. I utilize a greater variety of assessments to inform my instruction.
57. I align my instructional strategies with the Utah Common Core based on data.

These eight questions are specific questions addressing the use of data. Data have been

collected from coaches, teachers and principals by school district personnel.

Respondents will be coded by the district with a unique ID for all respondents that

enables all sources of data to be connected. The researcher will not have access to

personal identifiers with the data. All data will be imported into SPSS for analysis, and

all results be reported at the aggregate level.

Research Design and Analysis

Data Collection

Data collected for this study was retrieved with permission from extant data prepared

through the information systems department of the school district. The study used

existing teacher data for a period from the 2013 - 2014 school year. The data to be used

from this school district strictly adheres to the principles of ethical research. No

identifiable teacher data identifiers were obtained in this process. A SPSS format will be

used. Through the district's information system no teachers are linked to any used in

this study. The teachers were given the survey as a hard copy with a barcode on top

which had a district identifier. Teachers had the option of tearing this page off for

remaining anonymous reasons. The coaches also received surveys with the same

questions and the same scale. N=29 for the survey and it was collected through survey

monkey. The study will employ a simple linear regression for two of the questions and a

causal comparative research design for one of the questions. Specifically, this study will

be conducted using an Analysis of Covariance (ANCOVA.) Covariates are variables that

are correlated with the dependent variable and are included before the start of the

experiment to control or adjust the results for differences existing among subjects. This

excludes variance in the dependent variable attributable to the covariates, which

enables the study to focus on the variance explained in the dependent variable by group

differences. Alpha will be set at .05 to interpret statistical significance.

Variables and Measures

Variables

This research will address the Process, the Coaches and their involvment with

professional development as it affects the outputs of Teacher's Perceptions, Teachers'

Knowledge and Skills and Classroom Practice. As seen in the model below, Table 3-3 the

problem of teachers' lack of prepartation for use of data is addressed through the

academic coaching program.

Table 3-3 Addressing Teachers Using Data through Coaching Model
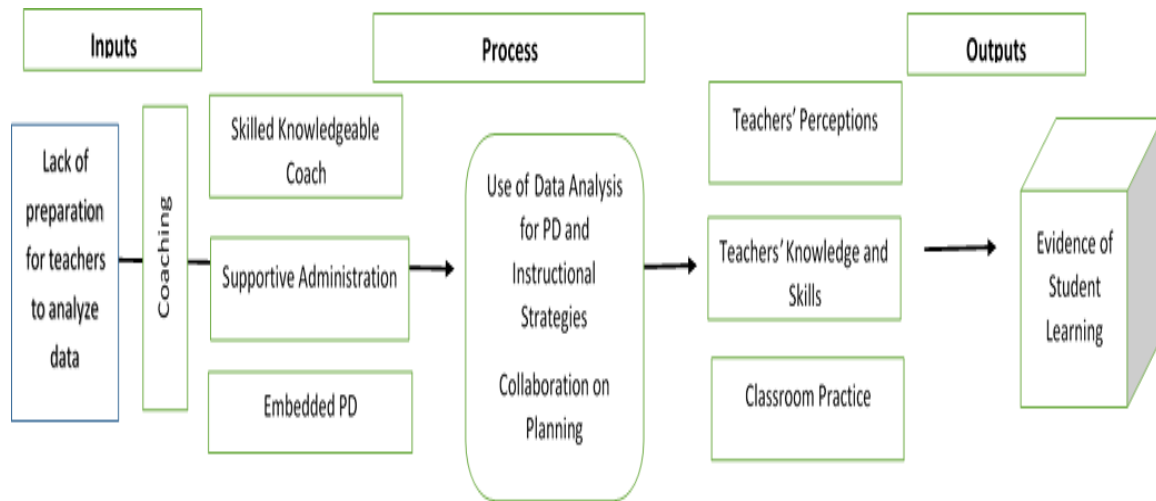
For question one, the dependent variable include the survey questions:

47. I feel more confident with the use of data to inform my instruction.
48. I am able to take time to reflect on data.
51. I use data to identify specific areas in which I can improve my instruction.
52. I evaluate student work more effectively.
53. When I use data, I am more able to get through to even the most difficult or unmotivated students.
54. My understanding of state assessments has improved.
55. I utilize a greater variety of assessments to inform my instruction.
57. I align my instructional strategies with the Utah Common Core based on data.

Independent Variable will include 2 groups: 0=did not work with coach and 1= worked with coach during the Fall Term of 2013. The alpha will be set at .05 significance. A linear regression is used to determine if there is a difference in working with a coach or not in the use of data. The Likert scale used included anchors: 1=Strongly Disagree, 2=Disagree, 3=Agree, 4=Strongly Agree, 5=N/A or Unknown.

Question two involves the amount of time the coaches spent in the schools. The data for this question was collected from the internal evaluation by school district. The

study will look for a positive or negative correlation between the frequency of total hours of coaching in a school and the teacher's use of data. Bivariate correlations will be studied for the factor teacher use of data with hours spent by a coach in their school and for teacher use of data with hours worked with a coach. This test will allow the researcher to determine whether the differences between the samples are due to random error or if there is definite correlation between the amount of time teachers' work with coaches and their use of data.

The third question, "To what extent does the practices of academic coaches predict the teacher's use of data?", will involve again a multiple regression will be used to determine the change in the dependent variable (based on the following independent variables:

- Data support - When I have a problem, the coach is helpful in developing a plan to address it

- Embedding data into everyday work - The coach is accessible to me

- Goal setting - The coach establishes clear priorities for our work together.

- Communication – The coach is a good listener

- Ensuring adequate professional learning - The coach helps me feel more empowered to continually grow as a teacher

- Modeling for data use - The coach models behavior that I want to develop

- The coach is an expert teacher. (Engaging in personal learning).

CHAPTER IV

Results

The purpose of this research was to explore the effect of academic coaches on the classroom teacher's use of data to make instructional decisions. This study used multiple quantitative methods including descriptive, inferential, and correlational statistics to describe the results of the research. This chapter details the results of the study. It is organized around the following three research questions of this study:

1. Is there a difference in use of data between teachers who worked with a coach and teachers who did not?

2. Is there a correlation between the amount of time working with a coach and teacher's use of data?

3. To what extent does the practices of academic coaches predict the teacher's use of data?

The samples were extracted from data obtained from a programmatic evaluation of the coaching program conducted by the school district (See Appendix A for complete survey). All teachers in the elementary and middle schools were given the voluntary opportunity to participate in the survey. The data were gathered early in the 2014 school term from the responses of 443 teachers. The coaches' focus was in the area of Language Arts, Math or Special Education. Thirteen Language Arts, fourteen Math and two Special Education Coaches were involved. They report directly to a supervisor for each content area, who, in turn, reports to the Director of Professional Development

(PD). The coaches receive PD, provided centrally, that focuses on such topics as adult learning, content expertise, the Common Core, assessment, use of data, and modeling. Coaches are housed in the participating schools. They were assigned to a school as either .2, .5 or 1 Full-time equivalent (FTE). Their role is developmental and is not part of the teacher evaluation process. They work with teachers one on one, in grade levels, departments, Professional Learning Communities and whole schools. The coaches were surveyed during the spring term of 2014.

Analyses of Data

Question One: Is there a difference in use of data between teachers who worked with a coach and teachers who did not?

Descriptive statistics are reported for each item on the survey. Independent Sample T-Tests were run to compare the teachers who worked with academic coaches and those who did not work with an academic coach means for the independent variable. Seven statements from the survey were used to analyze the teachers' perception on their use of data. The seven statements (by item number) from the survey chosen as the independent variable are:

47. I feel more confident with the use of data to inform my instruction.

48. I am able to take time to reflect on data.

51. I use data to identify specific areas in which I can improve my instruction.

53. When I use data, I am more able to get through to even the most difficult or unmotivated students.

54. My understanding of state assessments has improved.

55. I utilize a greater variety of assessments to inform my instruction.

57. I align my instructional strategies with the Utah Common Core based on data

The Likert scale used included the anchors: 1=Strongly Disagree, 2=Disagree, 3=Agree, 4=Strongly Agree, 5=N/A or Unknown. The teachers were given the survey as a hard copy with a barcode on top which had a district identifier. Teachers had the option of tearing this page off for remaining anonymous reasons.

The independent t-test was used to determine if there were statistically significant difference in the responses between the teachers who worked with a coach and those who did not.   The survey was self-reporting and items may have been skipped, therefore each question has a different n. For the purpose of this study the anchor 5=N/A or Unknown was not used.

Teachers Use of Data Item Frequencies

Table 4-1 show the frequencies of responses for the seven questions from the teacher survey that make up the teachers' use of data factor. The instructions for the survey were: "Please rate how working with the Language Arts, Math or Special Education (SPED) coaches has influenced you as a teacher. Please choose the one best response on your answer document." 70.7% of teachers report that they perceived that

their work with coaches increased their confidence in using data to inform instruction,

while 72.1% of the teachers report that working with coaches enabled them to better

use time to reflect on data. 80.8% of teachers reported using data to identify specific

areas in which they can improve their instruction. While 46.1% of the teachers report

use of data improves their abilities to get through to difficult or unmotivated students.

Teachers do perceive working with coaches improves their understanding of state

assessments as seen with 71.7% responding positively. 69.5% of the teachers utilize a

greater variety of assessments to inform their instruction and 76.8% of the teachers

reports align their instructional strategies with the Utah Common Core based on data.

Table 4-1 Frequencies of responses that structure the teachers' use of data factor.

	Valid Percent			
	Strongly Disagree	Disagree	Agree	Strongly Agree
I feel more confident with the use of data to inform my instruction	8.4%	20.9%	41.5%	29.2%
I am able to take time to reflect on data.	8.1%	19.8%	46.2%	25.9%
I use data to identify specific areas in which I can improve my instruction.	7.3%	11.9%	43.4%	37.5%
When I use data, I am more able to get through to even the most difficult or unmotivated students.	16.4%	37.5%	33.5%	12.6%

Table 4-1 (continued)	Valid Percent			
	Strongly Disagree	Disagree	Agree	Strongly Agree
I utilize a greater variety of assessments to inform my instructions.	8.4%	22.1%	43.0%	26.5%
I align my instructional strategies with the Utah Common Core based on data.	7.3%	16.0%	44.3%	32.5%

Teacher Use of Data Outcome- Item Means

Table 4-2 displays the means and standard deviations for each of the responses to the seven statements in the survey on the teachers' use of data. Additionally, it shows the means (M) and standard deviations (SD) for these statement variables, 1=Strongly Disagree, 2=Disagree, 3=Agree, 4=Strongly Agree.

Table 4-2 Means and Standard Deviations for each of the Responses for Data Use

I feel more confident with the use of data to inform my instruction. Teachers who work with a coach during the 2013-14 Academic Year mean (M=2.95, SD=0.905) is higher than the Teachers did not work with a coach (M=2.76, SD=0.932).

I am able to take time to reflect on data. Teachers who work with a coach during the 2013-14 Academic Year mean (M=2.97, SD=0.872) is higher than the Teachers did not work with a coach (M=2.54, SD=0.836).

Table 4-2 (continued)

I use data to identify specific areas in which I can improve my instruction. Teachers who work with a coach during the 2013-14 Academic Year mean (M=3.14, SD=0.892) is higher than the Teachers did not work with a coach (M=2.97, SD=0.816).

When I use data, I am more able to get through to even the most difficult or unmotivated students. Teachers who work with a coach during the 2013-14 Academic Year mean (M=2.44, SD=0.93) is slightly higher than the Teachers did not work with a coach (M=2.36, SD=0.797).

My understanding of state assessments has improved. Teachers who work with a coach during the 2013-14 Academic Year mean (M=2.93, SD=0.925) is higher than the Teachers did not work with a coach (M=2.84, SD=0.87).

I utilize a greater variety of assessments to inform my instruction. Teachers who work with a coach during the 2013-14 Academic Year mean (M=2.88, SD=0.916) is again slightly higher than the Teachers did not work with a coach (M=2.84, SD=0.816).

I align my instructional strategies with the Utah Common Core based on data. Teachers who work with a coach during the 2013-14 Academic Year mean (M=3.05, SD=0.89) is higher than the Teachers did not work with a coach (M=2.90, SD=0.831).

It should be mentioned here that the n = teachers working with an academic coach was much greater than the n = teachers not working with an academic coach during the academic year.

To examine whether there was a difference between the teachers use of data due to working with an academic coach or not, an independent samples t-test was run. The results shown in

Table 4-3 reveal a significant difference in the two group's assessment of the use of this factor by the teachers, t (364) = -2.187, p < .029. The teachers who worked with an academic coach (M=2.91, SD=0.782) distinctly feel their utilization of data influences their instruction more often than the teachers who did not work with academic coaches (M=2.67, SD=0.697).

Table 4-3 Independent Samples Test

| | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | |
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Equal variances assumed	1.276	.259	-2.187	364	.029	-.24279	.11099

Results from the t-test comparison of the teachers who reported working with coach and those who did not means are presented in Table 4-4.

Table 4-4 Independent t-Test – Teachers Use of Data Factor

Teacher Use of Data Factor		N	Mean	Std. Deviation	Std. Error Mean
Teacher Worked with a Coach	No	57	2.6717	.69775	.09242
	Yes	309	2.9145	.78239	.04451

Question Two: Is there a correlation between the amount of time working with a coach and teacher's use of data?

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This section focuses on the results regarding the second research question of this dissertation: Is there a correlation between the amount of time working with a coach and teacher's use of data to inform instruction. The data for this question were again collected from the internal evaluation by the school district. Bivariate correlations statistical test were run for the factor of teacher use of data with hours spent by a coach in their school and for teacher use of data with hours worked with a coach. A significant correlation was found between of total hours of coaching time per school and teacher use of data, r (353) = .352, p< .000 revealing a positive relationship between the frequency of total hours of coaching in a school and the teacher's use of data (see Table 4-5).

Table 4-5 Correlation of Teacher Use of Data with Hours Spent by a Coach in Their School

		Total Hours of Coaching Time Per School	Teacher Use of Data
Total Hours of Coaching Time Per School	Pearson Correlation	1	.352**
	Sig. (2-tailed)		.000
	N	422	355
Teacher Use of Data	Pearson Correlation	.352**	1
	Sig. (2-tailed)	.000	
	N	355	366

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

Likewise a significant correlation was found between the total coached hours and the teacher use of data, r (364) = .242, p< .000. These results, since the Sig. value is .000 (which is

less than .05), demonstrates that there is a significant correlation between the teacher use of data and the amount of time working directly with a coach. (Table 4-6)

Table 4-6 Correlation of Teacher Use of Data with Hours worked with a Coach

		Teacher Use of Data	Total_Coached_Hours
Teacher Use of Data	Pearson Correlation	1	.242[**]
	Sig. (2-tailed)		.000
	N	366	366
Total_Coached_Hours	Pearson Correlation	.242[**]	1
	Sig. (2-tailed)	.000	
	N	366	447

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

This is consistent with prior research that increasing the time schools use for collaborative planning through coaching improves teachers' use of data and thus address school improvement needs. (Showers and Joyce, 1996)

Question Three: To what extent does the practices of academic coaches predict the teacher's use of data?

Prior to analyzing the factors that predict practices of academic coaches that affect teacher's use of data, which it the focus of question three of this study, it is important to provide descriptive statistics on the characteristics of the survey questions. The factors previously discussed, the Teacher Use of Data factors were again used as the dependent variable.

A reliability test was performed using Cronbach's Alpha. Table 4-7 states the items have

a high degree of consistency, since the number is above .85.

Table 4-7 Reliability test of Teacher Use of Data Factor Statement

Reliability Statistics	
Cronbach's Alpha	N of Items
.934	7

The means of teacher use of data items are listed in table 4-8. The mean of responses to

the seven items determining the Teacher Use of Data factor in this study range from 2.42 to

3.11.

Table 4-8 Means of Teacher Use of Data Items in Descending Order

	N	Mean	Std. Deviation
I use data to identify specific areas in which I can improve my instruction.	411	3.11	.881
I align my instructional strategies with the Utah Common Core based on data.	400	3.02	.881
I feel more confident with the use of data to inform my instruction.	407	2.92	.911
My understanding of state assessments has improved.	399	2.90	.918
I am able to take time to reflect on data.	405	2.90	.880
I utilize a greater variety of assessments to inform my instruction.	407	2.88	.899
When I use data, I am more able to get through to even the most difficult or unmotivated students.	397	2.42	.909

The mean of Teacher Use of Data factor was n=366 (m=2.88, sd=.774).

Seven items were chosen from the survey representing what Wayman et al,(2007)

described as the leadership characteristics, strategies and events that coaches use to facilitate

data use on the part of teachers (Wayman, et al, 2007). The list includes (not in any particular order): communication, embedded data into everyday work, modeling data use, data use support, goal setting, engaging in their own personal learning, and ensuring adequate professional learning for faculty. The survey items (coaches' items) chosen as the predictor variables (with a description of Wayman's strategies in parentheses) were:

76. The coach is accessible to me. (Embedding data into everyday work)

77. When I have a problem, the coach is helpful in developing a plan to address it.

   (Data support)

79. The coach establishes clear priorities for our work together. (Goal setting)

81. The coach is a good listener. (Communications)

86. The coach helps me feel more empowered to continually grow as a teacher.

   (Ensuring adequate professional learning)

88. The coach models behavior that I want to develop. (Modeling for data use)

90. The coach is an expert teacher. (Engaging in personal learning)

The statements were prefaced with, "Please rate the extent to which you agree with the following statements describing the coaches and your work with the coaches. Please choose the one best response on your answer document." The means of the responses relating to the characteristics of coaches' items in descending order are shown in table 4-9.

	N	Mean	Std. Deviation
The coach is a good listener.	398	3.30	.835
The coach is an expert teacher.	342	3.18	.928
When I have a problem, the coach is helpful in developing a plan to address it.	388	3.10	.945
The coach is accessible to me.	416	3.09	.928
The coach establishes clear priorities for our work together.	388	3.01	.934
The coach helps me feel more empowered to continually grow as a teacher.	387	2.98	.993
The coach models behavior that I want to develop.	381	2.90	1.025

In that the teachers are self-reporting on this survey, they could choose to skip items, a

multiple regression with means replacing missing data was administered. The analysis would

predict the missing data mean and replace missing values for regression imputation, see table 4-

10.

Table 4-10 Multiple Regression with Means Replacing Missing Data

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.776a	.602	.595	.45651

a. Predictors: (Constant), The coach is an expert teacher., The coach is accessible to me., The coach is a good listener.,
The coach models behavior that I want to develop., The coach establishes clear priorities for our work together.,
When I have a problem, the coach is helpful in developing a plan to address it., The coach helps me feel more
empowered to continually grow as a teacher.

The statistical results presented above set the stage for question three, which sought to identify which factors predict characteristics of coaching practices to improve teacher's use of data. In order to determine what factors were associated with these indicators, simple linear regression analyses were conducted with teacher use of data factor from the survey as the dependent variables. The predictor variables in the regression were the seven statements related to the Wayman strategies. Overall, the model was significant (F=90.162, p<.000). In other words, the four predictors explain characteristics or coaching practices that would enhance teachers' use of data better than chance alone (see Table 4-11).

Table 4-11 Overall Model with All Seven Statements Regression

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	131.526	7	18.789	90.162	.000b
Residual	87.110	418	.208		
Total	218.636	425			

a. Dependent Variable: Teacher Use of Data

b. Predictors: (Constant), The coach is an expert teacher., The coach is accessible to me., The coach is a good listener., The coach models behavior that I want to develop., The coach establishes clear priorities for our work together., When I have a problem, the coach is helpful in developing a plan to address it., The coach helps me feel more empowered to continually grow as a teacher.

Results revealed that the statements: coach is accessible to me, the coach is a good listener, and the coach is an expert teacher, were not related to teacher use of

data. The following statements however are significant predictors of coaching practices

that influence teacher use of data:

77. When I have a problem, the coach is helpful in developing a plan to address it. (ϐ= .156)

79. The coach establishes clear priorities for our work together. (ϐ= .219)

86. The coach helps me feel more empowered to continually grow as a teacher. (ϐ= .255)

88. The coach models behavior that I want to develop. (β= .170)

The "coach helps me feel more empowered to continually grow as a teacher" item was

the most powerful predictor. It is still important to emphasize that model summary did

show a significance of .000. Individual coefficients are shown in Table 4-12.

Table 4-12 Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.906	.102		8.925	.000
The coach is accessible to me.	.037	.038	.048	.979	.328
When I have a problem, the coach is helpful in developing a plan to address it.	**.124**	**.052**	**.156**	**2.377**	**.018**
The coach establishes clear priorities for our work together.	**.176**	**.048**	**.219**	**3.652**	**.000**
1 The coach is a good listener.	-.048	.049	-.054	-.988	.324
The coach helps me feel more empowered to continually grow as a teacher.	**.193**	**.050**	**.255**	**3.874**	**.000**

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Table 4-12 (continued)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
The coach models behavior that I want to develop.	**.126**	**.046**	**.170**	**2.716**	**.007**
The coach is an expert teacher.	.049	.045	.057	1.103	.270
The coach helps me feel more empowered to continually grow as a teacher.	**.193**	**.050**	**.255**	**3.874**	**.000**

CHAPTER V

Findings, Implications, Recommendations, and Conclusions

This chapter is organized in two major sections: (a) a discussion of the findings of

the research and the implications it has on professional development, and (b)

recommendations from the study for future research, police and practices. This study

involved the subject of academic coaching and the effect on the teacher's use of data in

making instructional decisions. Data use has been under the microscope for a decade.

In 2005 the *104th Yearbook for the National Society for the Study of Education* provided

a unique set of articles on the subject of data use and misuse. Again in 2007, *106th*

Yearbook for the National Society for the Study of Education provided studies on

evidence and decision making in schools. Throughout the collection of these articles,

the effect of academic coaching as a training model for teachers is not addressed.

Therefore, this study of: the difference in use of data between teachers who worked

with a coach and teachers who did not; the correlation between the amount of time

working with a coach and differences in the teacher's use of data; and to what extent

does the practices of academic coaches predict the teacher's use of data and offer

insight for future reference.

Findings and Implications

The data from the study revealed, with equal variance assumed, that working

with an academic coach improves the teacher's use of data (.029 significance). Coaching

is viewed as a collaborative and successful professional development model (Joyce &

Showers, 1995; Denton & Hasbrouck, 2009; Feltz, et al., 1999; Garet,et al., 2001;

Hopkins-Thompson, 2000). Recently Marsh, et al. (2007) published an article on the

topic of academic coaches supporting data driven decisions, "Common findings include

teacher reports of greater differentiation of instruction, greater collaboration among

school faculties, and improved identification of students' learning needs as a result of

increased data use (Chen, Heritage, & Lee, 2005; Copland, 2003; Feldman & Tung,2001;

Wayman & Stringfield, 2006)…"Instructional coaching is one potential avenue for

providing teachers with professional development on DDDM (data driven decision

making)." (Marsh, McCombs, & Martorell, 2010, p. 875). The teachers working with the

academic coaches are involved with many 1-on-1 activities that incorporate classroom

instruction as well as use of data from the current students.

> "While more empirical research is needed, what emerged from the
> Reading First study was that the most central task coaches engaged in was
> providing groups of teachers with onsite professional development? This also
> held true with … coaches. When the tasks of facilitating PLCs, Organizing PD, and
> providing PD were combined, over 3,500 hours (28%) of their time was spent in
> this role. The table on the next page summarizes the tasks on which coaches
> spent their time. The most important finding is that coaches spent almost all of
> their time on tasks directly related to teaching and learning. Previous research
> on coaches in other settings reveals that they often are asked to perform tasks
> that can be classified as administrative. In the district, they appear to be
> buffered and/or not asked to perform tasks that distract them from their
> primary goal of facilitating the improvement of teaching and learning."
> (Hausman, Shaeffer, & Shoemaker, 2014 p17)

Again, Marsh, et al.(2007) state, "Advocates and researchers often point to learning

theory and research on professional development as the rationale for coaching.

Learning theory suggests that individuals learn best when provided with opportunities

to discuss and reflect with others, to practice application of new ideas and receive

feedback from an expert, and to observe modeling (Brown, Collins, & Dugrid, 1989;

Collins, Brown, & Holum, 1991; Lave, 1988; Lave & Wenger, 1991; Rogoff, 1990; Tharp &

Gallimore, 1988; Vaughan, 1996). Empirical research further suggests that the transfer

of ideas from the traditional professional development model of one-shot workshops

into actual instructional change and increases in student learning is extremely limited

(e.g., Garet et al., 1999; Garet, et al., 2001; Hawley & Valli, 1999; Showers & Joyce,

1996)."(Marsh, McCombs, & Martorell, 2010, p875)

   The second research question pertains to study of dosage: is there a

correlation between the amounts of time working with a coach and a difference in the

teacher's use of data? The results of the study revealed a strong positive correlation

between the total hours of coaching time per school and teacher use of data, r (353)

=.35, p< .000. The correlation of 1 to 1 for this researcher confirms the need of support

in the use of data for decision-making as an embedded program. Three districts

participated as partners with the Institute for Learning (IFL). As part of the study a focus

on efforts to improve teaching and learning through the use of data decision-making

showed that "…two IFL districts made stronger district-level investments in supporting

school staff with data analysis. They employed several individuals in the district office

with strong data analysis skills and tasked individuals to "filter" data and make them

more usable for school staff (a strategy found to be successful in several studies, such as Bernhardt, 2003; Choppin, 2002; Herman & Gribbons, 2001). In one district, school-based coaches often took the first step of analyzing test results and presenting them in usable forms to school faculties. Both districts also targeted extra support for data use in the lowest performing schools, frequently presenting state and district assessment data in easy-to-read reports and visiting schools to assist in planning and benchmarking progress." (Ikemoto & Marsh, 2007, p122). The research found that the coaches with expert content knowledge and training in the translation of data into information, created a collaborative time period effective for teachers during their school day, where the data analysis was pertinent for their individual student's needs. The research further shown that coaches that are knowledgeable about the curriculum, the school district, the students and the culture, provides a sense of trust during the translation of data into information and action plans. This leads to the final research question; to what extent does the practices of academic coaches predict the teacher's use of data?

The characteristics or practices of academic coaches that would influence teachers' use of data are based on Waymen et al., (2010). In the article thirteen strategies were identified to facilitate faculty data use: focus data on the larger context, facilitating collaboration around data, distributing leadership, fostering common understandings, ensuring adequate professional learning opportunities, modeling for data use, asking the right questions, engaging in personal learning, communication, structuring time to use data, goal-setting, data system support, and embedding data into everyday work.   The survey questions were not written to address all of these

strategies, but seven were chosen: embedding data into everyday work (Q76), data system support (Q77), goal-setting (Q79), communication (Q 81), ensuring adequate professional learning (Q86), modeling for data use (Q88)and engaging in personal learning (Q90).   The teachers were asked to rate the extent to which they agreed with the following statements describing the coaches and teachers' work with the coaches using the Likert scale: were 4=Strongly Agree, 3=Agree, 2= Disagree and 1= Strongly Disagree. Due to teachers' ability to skip questions on the survey if they wished, the missing data was replaced with the mean of the response to the question. A linear regression was conducted to examine the relationship between the teacher use of data and the predictors mentioned above. The teacher use of data was positively and significantly influenced by the predictors: (Constant), The coach is an expert teacher., The coach is accessible to me., The coach is a good listener., The coach models behavior that I want to develop., The coach establishes clear priorities for our work together., When I have a problem, the coach is helpful in developing a plan to address it., The coach helps me feel more empowered to continually grow as a teacher. The linear regression model with all seven predicators produced R^2 = .595, p<.000. As can be seen in the table 5-1 below, "the coach is accessible to me" did not have a significant response weight, possibly because the coaches' accessibility was not an issue for the teachers. Also "the coach is a good listener" was not significant nor was "the coach is an expert teacher". However, the statements: "when I have a problem the coach is helpful in developing a plan to address it" (M=2.37, p=.018); "the coach establishes clear priorities for our work together" (M=3.65, p=.000); "the coach helps me feel more

empowered to continually grow as a teacher" (M=3.87, p=.000); and" the coach models

behavior that I want to develop" (M=2.71,p=.007) all elicited responses that were

significant. These statements refer to data system support, goal-setting, ensuring

adequate professional learning, and modeling. For these particular teachers in the

study, the highest mean was for "the coach helps me feel more empowered to

continually grow as a teacher".

The implications from this study are clearly lead to the conclusion that

academic coaching has a positive effect on teachers' use of data. Again from Marsh,

"Despite the dearth of research on effects, many studies have identified a set of factors

that are associated with more effective use of data by educators (for a review, see

Marsh et al., 2006). Notably, several studies identify the importance of providing

training to educators on how to use data and connect them to practice (Black & William,

1998; Datnow, Park, & Wohlstetter, 2007; Mason, 2002; Supovitz & Klein, 2003). Such

training tends to address skills such as formulating research questions, interpreting

results, and effectively developing and using classroom assessments, and often provide

educators opportunities to discuss data and use their own real-life data issues and

school challenges rather than hypothetical cases (Chen et al., 2005; Copland, 2003;

Herman & Gribbons, 2001; Love, 2004; Mason, 2002; Murnane, Sharkey, & Boudett,

2005)." (Marsh et al., 2007 p 285) The training as described above is consistent with

what this study show that academic coaches provide.

Recommendations and Conclusions

With the arrival of No Child Left Behind and the emphasis on student achievement scores as well as highly qualified teachers, K-12 teacher evaluations systems have changed. The new systems include walk-throughs or snapshots, where several times a year an administrator steps into a classroom and observe the instruction. The standard formal evaluation is still a function with teacher choice of professional development tied to the outcomes of the evaluation. The formal evaluation includes reflections from the teachers on their view of what professional growth they see as a need. This leads to the discussions of peer evaluation with academic coaches participating as the teacher evaluator. As we have seen the academic coach is involved with teacher growth in the area of data use. What are the implications of having the academic coach whose knowledge of the teacher's data and classroom practice act as the evaluator? If evaluations are or can be tied to teacher dismissal, do you want peer evaluators whose function it is to assist teachers improving instruction? At the same time would peer evaluations provide a better conduit for improvement for teachers, having a peer who is so readily involved with the strengths and weaknesses of a teacher and supporting a tailored individual plan for change? Would peer evaluation raise the stakes for the academic coach creating a better or worst working relationship? Would the evaluations have a bias as the person who is creating the growth plan is also the person who is providing the professional growth? These are questions to pursue in future studies.

One of the unexpected outcomes of this study was the lowest mean of an item from the survey with the t-test, "When I use data, I am more able to get through to even the most difficult or unmotivated students."(M=2.44, SD=0.93). If coaches are making a difference in the use of data for instructional changes and one of the higher survey items, (I use data to identify

specific areas in which I can improve my instruction." (M=3.14, SD=0.892), why is efficacy still

the lowest mean? The data needs further mining to view if this affect is seen for both poor

performing schools as well as schools with higher student success.

Another area which would benefit from a future qualitative study is the issue of

improved reflection state the mean and the statement. If the infrastructure for the teachers has

not changed, how are the teachers enabled to have improved reflection time; are they using

planning time or are they using time after school, their own time?

Another outcome of such a study would provide an answer to are the teachers actually

using data? The survey from the academic coaches and the principals of the study confirm the

teachers use of data for instructional decisions, evidence should be examined for a future study.

The data from this study could be triangulated with data from the larger study which included

academic coaches' and the principals' surveys to validate the self-reporting data. The study

could also disaggregate the data to provide the differences between the elementary teachers

and the middle school teachers, information not found in this study.

Of the seven items chosen as "practices" of coaches it was mentioned that the

interpersonal skills means were not individual significant. One of the items is the statement

"the coach is an expert teacher". Future studies should investigate expertise the

teachers are referring to, is it their content knowledge? Their expertise in pedagogical

practice? What is an expert teacher?

With the increase of accountability, teacher leadership or educational leadership has

become an area of study. Leithwood and Riehl describe school leaders as "…those persons,

occupying various roles in the school, who provide direction and exert influence in order to

achieve the school's goals. …Leadership functions can be carried out in many different ways,

depending on the individual leader, the context, and the nature of the goals being pursued."

(Leithwood, K. & Riehl, C., 2003 p 2). As a school leader one would have expected teachers to

value the academic coaches' interpersonal skills more than the classroom process. One more

important outcome from the study, one that would bring a dialogue about the process of

implementation of the academic coach program, are the classroom practices or "tasks" were

more important than the interpersonal relationships as seen in the practices from research

question three. One direction of study would be to describe the implementation of the school

studied and relate the teacher's readiness as describe by Hersey and Blanchard constructed a

model of leadership based on readiness in a continuum of four levels:

> "R1 - low follower readiness - refers to low ability and low willingness of followers i.e.
> those who are unable and insecure
>
> R2 - low to moderate follower readiness - refers to low ability and high willingness of
> followers i.e. those who are unable but confident
>
> R3 - moderate to high follower readiness - refers to high ability and low willingness of
> followers i.e. those who are able but insecure
>
> R4 - high follower readiness - refers to high ability and high willingness of followers i.e.
> those who are both able and confident" (Hersey & Blanchard, 1979)

The model continues to describe leadership styles based on combination of task and

relationship behavior:

- "Task behavior: Extent to which the leader spells out the duties and responsibilities of a
  follower which includes providing them direction, setting goals, and defining roles for
  them. Usually a one-way communication exists which is meant to provide the direction
 to the followers.

- Relationship behavior: Extent to which the leader listens to the followers, and provides encouragement to them. Here, a two-way communication exists between the leader and the follower. By combining the task and the relationship behavior, we arrive at the following four different styles of leadership which correspond with the different levels of readiness." (Hersey & Blanchard, 1979)

Is it possible that the task at hand, improving student success, was more important to the teachers than the relationships? Other factors such as described in the readiness factors could account for the results, but further studies should be considered. This could affect the introduction and the success of academic coach programs and policies.

Table 5-1 Theory of Teacher Change
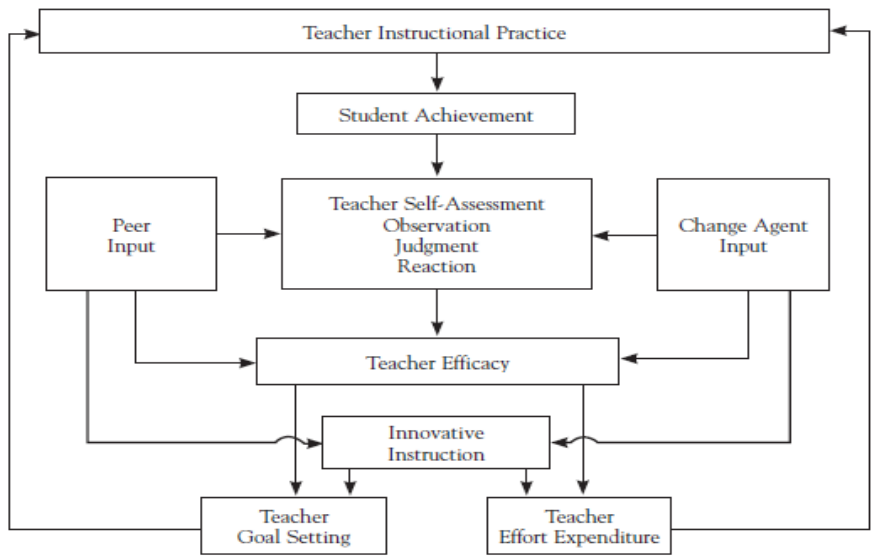
There is increasing emphasis on initiatives within P-12 schools that involve teachers' understanding of the data presented to them through various assessments, surveys and observations. This information is to be used to improve student achievement or as is now referred to "student success". Ross & Bruce (2007, p53) show one theory of teacher change from a qualitative study. As seen in table 5-2, the teacher self-assessment component is to: "(a) observe their effect on student achievement, (b) make a judgment about how well they attained their instructional goals, and (c) reflect on their satisfaction." This study shows that these can

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be influenced by other agents, such as academic coaches. Future studies on the effects of academic coaches on teachers' use of data as it effects teacher efficacy would be important as the change in instructional practice is also affected by teacher efficacy.

Also it is recommended that this study be followed with one on the effects of academic coaches and teachers' use of data on student achievement. The issue of student success is at, or should be at, the center of future discussions within the educational community. As we view the many changes in the field of education and society, the answer that is becoming more obvious is not to work harder but to work smarter. The National Network of State Teachers of the Year published a paper *From Good to Great, Exemplary Teachers Share Perspectives on Increasing Teacher Effectiveness Across the Career Continuum (Date).* The recommendations from the teachers of the year for policymakers and education leaders include the following:

1. "Support teachers teaching teachers. Creating opportunities for teacher leaders or academic coaches to work with struggling and new teachers.

2. Act on what we know works. Educators agree on several practices such as pre-service clinical experiences, collaboration of professionals, placement of teachers in appropriate licensure and expertise. Educators need to be allowed to address policy makers with their input on their practice.

3. Reconsider the dialogue. The ongoing formal education and professional development that is most effective need to be determined and best practices in continuing educating and training should be sought to benefit all teachers.

4. Prioritize and improve teacher development on many fronts. The teachers cited many avenues of effective growth. These opportunities ranged from national board certification programs to effective cooperating teacher programs, opportunities for

collaboration and the development of professional growth plans. Teachers also

cited weak or low quality programs such as school wide district-mandated

professional development programs."

One should take notice the first recommendation support teachers teaching teachers." Creating

opportunities for teacher leaders or <u>academic coaches</u> to work with struggling or new teachers.

This study has provided supporting evidence for this recommendation and direct implications

for future research.

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APPENDIX A:

Teacher Survey - February 2014

Teacher Survey - February 2014

When responding to the following questions on this survey, please think of the Language Arts coach(es) or Math coach(es) or Special Education Coach(es) (if you are a Special Education Teacher) that have worked with your school. Then respond to all statements with the content area you selected in mind.

Responses to the statements are bubbled in on the separate answer document. You will not need to respond to any of the statements on this document.

***Mark the one coaching area to which your responses apply on your answer document.

Please rate your level of agreement that the Language Arts, Math or SPED coaches do the following at your school. Please choose the one best response on the answer document.

Likert Scale: 1=Strongly Disagree, 2=Disagree, 3=Agree, 4=Strongly Agree, 5=N/A or Unknown

1. Assists with professional development that is data driven.
2. Assists with professional development that aligns with the goals in our *School Improvement Plan*.
3. Assists with ongoing professional development that provides opportunities for teachers to work with their colleagues to grow as teachers.
4. Assists with professional development that increases teachers' ability to differentiate instructional strategies that meet diverse student learning needs.
5. Assists with professional development that is differentiated to meet the individual needs of teachers.
6. Includes teachers in decisions regarding professional development.
7. Works with teachers to utilize instructional technology more fully.
8. Contributes to the improvement of instruction.
9. Helps teachers overcome barriers to student learning.
10. Models research-based instructional procedures.
11. Deepens content knowledge.
12. Supports innovative teaching strategies.
13. Holds high standards for teacher performance.
14. Assists in developing formative or interim assessments.
15. Enhances teachers' understanding of SAGE.

16. Promotes teacher use of data to inform their instruction.
17. Helps identify areas for the professional growth of teachers based on data.
18. Provides sufficient time for making sense of data.
19. Supports the use of data in a non-threatening manner.
20. Facilitates the use of data to improve student learning.
21. Supports the use multiple sources of data on student performance to improve instruction for Tier II students.
22. Helps identify areas for school improvement based on data.
23. Facilitates honest conversations about data between teachers.
24. Encourages teachers to reflect on their practice.
25. Works collaboratively with teachers.
26. Includes faculty in the decision-making process.
27. Works collaboratively with school administration.
28. Supports the work of teachers in Professional Learning Communities (PLC) and/or Collaboratives.
29. Provides opportunities for collaboration with colleagues across grade levels.
30. Provides opportunities for collaboration between different schools.
31. Improves teachers' understanding of the Utah Common Core.
32. Enhances teachers' ability to align instruction with the Utah Common Core.
33. Provides important communication between the district and school.
34. Provides resources needed for instruction.
35. Provides guidance on the effective use of instructional materials.
36. Promotes a positive school culture.
37. Treats teachers like professionals.
38. Helps create settings that are safe places in which to collaborate about how to improve teaching and learning.
39. Reduces teacher stress arising from changes in the state core and assessments.
40. Communicates fairly and honestly
41. Helps teachers improve communication with parents.
42. Provides feedback about instruction in a positive manner.
43. Leads teachers in the implementation of strategies that increase the percentage of students that are proficient learners.
44. Holds high standards for student performance.
45. Facilitates the use of strategies to close gaps in student achievement.
46. Provides support that has helped our school improve.

Please rate how working with the Language Arts, Math or SPED coaches <u>have influenced you as a teacher.</u> Please choose the one best response on your answer document.

47. I feel more confident with the use of data to inform my instruction.
48. I am able to take time to reflect on data.
49. I reflect more on ways to improve student learning.
50. I am more self-aware as a professional.
51. I use data to identify specific areas in which I can improve my instruction.
52. I evaluate student work more effectively.
53. When I use data, I am more able to get through to even the most difficult or unmotivated students.
54. My understanding of state assessments has improved.
55. I utilize a greater variety of assessments to inform my instruction.
56. I have a deeper understanding of the Utah Common Core.
57. I align my instructional strategies with the Utah Common Core based on data.
58. I have participated in professional development that is more relevant to my needs.
59. I have participated in professional development on research-based instructional strategies.
60. I feel more a part of a collaborative team at school.
61. I have more opportunities to collaborate with my colleagues.
62. I am better able to overcome barriers to teaching and learning.
63. I have higher expectations of all students.
64. I reflect more on my beliefs about student learning.
65. I feel more effective as a teacher.
66. I am more effective motivating students who show low interest in school work.
67. I differentiate instruction to better meet the needs of students with diverse learning styles.
68. I use more technology to support teaching and learning.
69. I have more expertise as a teacher.
70. My lesson planning has improved and is more intentional.
71. I have increased student engagement in my classroom.
72. I am better able to locate resources for my classes.
73. I utilize Core materials more strategically.
74. My classroom management has improved.
75. I feel more aware of changes occurring at the district and state level.

Please rate the extent to which you agree with the following statements describing the <u>coaches and your work with the coaches.</u> Please choose the one best response on your answer document.

76. The coach is accessible to me.
77. When I have a problem, the coach is helpful in developing a plan to address it.
78. When I ask for something, the coach is prompt in responding to my request.
79. The coach establishes clear priorities for our work together.
80. The coach provides constructive feedback without making me feel bad.
81. The coach is a good listener.
82. I feel comfortable when working with the coach.
83. The coach continues to support my professional growth.
84. The coach contributes positively to the improvement of my instruction.
85. The coach is ethical and professional in their interaction with me.
86. The coach helps me feel more empowered to continually grow as a teacher.
87. The coach helps me create goals to improve as a teacher.
88. The coach models behavior that I want to develop.
89. The coach asks questions that encourage me to think deeply about my instruction.
90. The coach is an expert teacher.
91. The coach understands the needs of our school.
92. The coach performs duties in a professional manner.

Please complete the background information items (93-94) on your answer document.

Thank you for taking time to complete this survey.

APPENDIX B:

Comparison of Major Coaching Approaches and Two Consultation Models

(Denton and Hasbrouck)

TABLE 1 Comparison of Major Coaching Approaches and Two Consultation Models

Application	Sources	Definition	Purpose/Focus	Coach or consultant's role	Activities/Procedures
Technical coaching (as operationalized in the America's Choice School model)	Poglinco et al. (2003)	A relationship between teachers and more accomplished peers for the purpose of supporting teachers' implementation of new instructional approaches, materials, and practices with high fidelity	• Support teachers' implementation of an instructional reform initiative • Improve teachers' practices	• Coach has an instructional, "expert" role	• Provide professional development • Model instruction • Observe teachers and provide feedback to increase fidelity of implementation • Lead teacher study groups to disseminate information about new practices and lead meetings to examine student work
Problem-solving coaching (as operationalized in Student-Focused Coaching)	Hasbrouck & Denton (2005)	Coaching is "a cooperative, ideally collaborative relationship, with parties mutually engaged in efforts to provide better services for students" (p. 2).	• Improved student outcomes • Solve problems (situations that impede student progress) • Teachers and coaches learn from each other • Prevent future problems	Coach has three primary roles: • Facilitator (encourages collaboration) • Collaborative problem-solver • Teacher/learner (provides professional development, learns from teachers, and supports teachers in learning from each other)	• Collaborative problem-solving with teachers to design individualized plans to support student progress • Support problem identification, plan implementation, and evaluation through co-planning, modeling, classroom observation, and data collection and analysis • Model and promote teacher self-reflection • Provide targeted, differentiated professional development
Reflective practice coaching (as operationalized in Cognitive Coaching)	Center for Cognitive Coaching (2007); Garmston, Linder, & Whitaker (1993)	Cognitive Coaching is "a process in which teachers explore the thinking behind their practices" (Garmston et al., 1993; p. 57).	• Improved instruction • Increased teacher reflection and capacity for problem-solving • Teacher autonomy • Teachers' use of questioning and paraphrasing strategies with their students	The coach is a mediator who helps the teacher become aware of the thinking that guides his or her behaviors.	• Professional dialogue • Cycle of preconference, lesson observation directed by information needed by the teacher, and post-conference • Application of a set of strategies in conferencing, including asking probing questions, paraphrasing, and strategic use of wait time
Team-building coaching (as operationalized by the Showers & Joyce peer coaching model)	Showers & Joyce (1996)	• Teams of teachers support each other as they learn to implement innovations learned in professional development • Implemented school-wide with a cohesive commitment to change	• Teacher implementation of instructional innovations • Transfer of learning from professional development into classroom practice	Role of the peer coach: • Support other teachers as they implement an instructional innovation • Support one another in the change process	• Teams of teachers meet to support the implementation of an innovation • Dyads observe each other with no feedback given • Teachers learn from each other as they plan instruction, observe each

TABLE 1 (*Continued*)

Application	Sources	Definition	Purpose/Focus	Coach or consultant's role	Activities/Procedures
Reform coaching (as operationalized by Neufeld & Roper's description of change coaches)	Neufeld & Roper (2003)	"Coaching is school-based professional development designed in light of the district's reform agenda and guided by the goal of meeting schools' specific instructional learning needs" (p. 4).	Increased capacity of principals and teachers to implement school-wide instructional reform; Increased instructional leadership from the principal	"Act as strategists and assistants in building capacity for shared decision making" to "spread instructionally focused responsibility throughout the school community" (p. 5).	other, and reflect on the impact of their behaviors on their students' progress • Collaborative planning • Monitoring implementation and results • Data collection • Facilitate teacher-principal communication and collaboration • Help principals promote leadership in teachers • Help principals understand how to use assessment data to improve instruction • Organize school resources and assist with scheduling to support instruction and collaboration • Facilitate classroom observations conducted by the principal
Instructional consultation	Rosenfield (1995a; 1995b)	• A voluntary relationship to assist a person in professional growth • "Can be conceptualized not only as an indirect service delivery method ... but also as an ... in-service training process ..." (1995a, p. 301)	Improved student academic achievement	The coach is primarily a problem-solver, based on the recognition that (a) the learner is one part of an "instructional system": the learner, the task, and the instructional and management strategies implemented, and that (b) academic difficulties do not reside solely within the learner.	• Systematic problem-solving related to academic concerns • Use of curriculum-based assessment • Supporting teachers in implementing interventions; ensuring that they are implemented appropriately • May include system-wide interventions • May be implemented by IC teams, promoting school-wide collaboration
Collaborative consultation	Idol, Nevin, & Paolucci-Whitcomb (1995)	"Collaborative Consultation is an interactive process that enables groups of people with diverse expertise to generate creative solutions to mutually defined problems" (p. 347).	To provide effective educational programs to students with special needs in the general education classroom and to support teachers who have students with special needs in their classrooms	A team of collaborators engage in the problem-solving process, applying (a) knowledge of effective instruction, assessment, and classroom management, (b) interpersonal communication and interactive problem-solving skills; and (c) relevant intrapersonal attitudes.	Systematic collaborative problem-solving: • Gaining entry and stating goals • Problem identification • Recommending interventions • Implementation of recommendations • Evaluation • Follow-up

Note. Instructional Coaching = IC.

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APPENDIX C:

IRB Approval

EASTERN KENTUCKY UNIVERSITY
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Graduate Education and Research
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NOTICE OF IRB EXEMPTION STATUS
Protocol Number: 14-202
Institutional Review Board IRB00002836, DHHS FWA00003332

Principal Investigator: Barbara Q. Shoemaker Faculty Advisor: Dr. Charles Hausman

Project Title: The Effect of Academic Coaches on Teacher's Use of Data

Exemption Date: 05/13/14

Approved by: **Dr. Pat Litzelfelner, IRB Member**

This document confirms that the Institutional Review Board (IRB) has granted exempt status for the above referenced research project as outlined in the application submitted for IRB review with an immediate effective date. Exempt status means that your research is exempt from further review for a period of three years from the original notification date if no changes are made to the original protocol. If you plan to continue the project beyond three years, you are required to reapply for exemption.

Principal Investigator Responsibilities: It is the responsibility of the principal investigator to ensure that all investigators and staff associated with this study meet the training requirements for conducting research involving human subjects and follow the approved protocol.

Adverse Events: Any adverse or unexpected events that occur in conjunction with this study must be reported to the IRB within ten calendar days of the occurrence.

Changes to Approved Research Protocol: If changes to the approved research protocol become necessary, a description of those changes must be submitted for IRB review and approval prior to implementation. If the changes result in a change in your project's exempt status, you will be required to submit an application for expedited or full IRB review. Changes include, but are not limited to, those involving study personnel, subjects, and procedures.

Other Provisions of Approval, if applicable: None

Please contact Sponsored Programs at 859-622-3636 or send email to tiffany.hamblin@eku.edu or lisa.royalty@eku.edu with questions.

Kentucky

Eastern Kentucky University is an Equal Opportunity/Affirmative Action Employer and Educational Institution

APPENDIX D:

Curriculum Vitae

Barbara Q. Shoemaker, Ed.D.
Primary 1057 Meadow Creek Drive
Oneida, Tennessee 37841
Secondary 1061 Merrick Drive Apt 150C
Lexington, Kentucky 40502
Phone: (423) 569-4887 Mobile: (423) 215-2523
E-mail Address: bshoe3@gmail.com

EDUCATIONAL BACKGROUND:	**Eastern Kentucky University** – (2011-2014) Ed.D. Educational Leadership and Policy Studies
	University of Kentucky - (2007-2009) Coursework in Educational Policy
	University of Tennessee – (1998-2000) M.S. in Educational Leadership
	Tennessee Technological University – (1989-1990) Biology Certification
	University of Tennessee – (1987) B.S. in Agriculture, Ornamental Horticulture and Landscape Design

Teaching Certification

State of Tennessee   03 Professional Biology Master's Career Level 1 Teacher Expires 08/31/2015

State of Tennessee   Beginning Administrator Master's Career Level 1 Teacher Expires 08/31/2015

Professional Experience

Present - Eastern Kentucky University Assistant Online Coordinator, responsible for providing services to faculty and students enrolled in the University's online degree programs to ensure student enrollment, retention and the effective administration of online degree programs specifically the graduate programs in the College of Education. Facilitator of online courses including introduction to research.

2013-2014 Eastern Kentucky University Graduate Assistant

Duties include teaching, research and services related to the program of study such as program evaluation.

2006-2013 University of Kentucky K12 Liaison and Partnership Enhancement Project (PEP) Coordinator

Management of Partnership Enhancement Project (PIMSER), grant program funded by the National Science Foundation, including financial management, data collection, reports and documentation, and facilitation of the program evaluation. Provide expertise in professional development planning, program review and evaluation, educational leadership and creating educational partnerships. Act as liaison between K12/University of Kentucky engagement partnerships, assist in training of K12/IHE faculty engagement teams at the University of Kentucky and/or school sites, travel to schools to assist in grant writing, designing professional development, implement professional development units. Assist in K12/UK projects evaluations and assessment of outcomes, liaison for PIMSER with College of Education, College of Arts and Sciences, and other UK education centers. Supports PIMSER units with data collection and analysis, data support for K12 schools and assist PIMSER engagement faculty in outcomes assessments project evaluation and external grant writing.

2004-Ongoing Science Program Improvement Review – Lead Reviewer National Science Teachers Association (NSTA)

As a reviewer, educators collaborate with school district administrators and school leaders to gather data for assessment and evaluation. Measuring the science program against the NSTA standards gives leverage to the leadership to bring consensus to all participants for change. As lead reviewer, I coordinate activities as well as being responsible for the final written product.

2004-2006 Science Teachers and Education Consultant

Classroom facilitator/instructor for 7th and 8th grade science in the Scott County
School District. Facilitator of the Parks as Classroom Grant with the Big South Fork National River and Recreation Area. Administrator/Trainer for the Understanding by Design Grant involving five school districts. Responsible for the planning, implementation of Summer Science Academy, Exploring Mammals for Kentucky Department of Education. Facilitate the week long program provides modeling and instruction to Kentucky teachers on science inquiry, reading strategies, and materials for outdoor activities for students.

2003-2004 Director of National Dissemination, First Hand Learning, Inc., Buffalo, NY

A one-year position funded for the national dissemination of all First Hand Learning products and programs a nonprofit organization with support from the National Science Foundation and the Howard Hughes Medical
Institute. Provide organizational leadership as a member of the management team.

1991-2005 Oneida Special School District, Oneida, Tennessee

- Appalachian Math & Science Partnership (AMSP) Internship Sponsored through Oneida Special School District, the internship allows for time for independent

professional growth while gathering and conducting research for the AMSP based on summer content institutions. Program Improvement
Reviews were conducted as a National Science Teacher Association
Intern.

- South Fork Local Systemic Change Pilot Project Director- Involved Kentucky and Tennessee school districts with science curriculum issues and assessments. Developed a K-8 curriculum matrix involving teachers, scientist and university educators. Designed and facilitated content studies programs, curricula study programs and classroom instructional strategies programs. Conducted Program Improvement Reviews (PIR) and classroom evaluations. Facilitate the day to day project activities, to networking the 10 districts, to conduct and coordinate the lead teachers and the administrators, to design and implement the workshops for science kit training, design technology training, coordinate all project meetings, liaison with the evaluators; and oversee the Science Materials Resource Center.
- Middle School Science and Math Teacher, District Science Fair Coordinator, Scholar's Bowl Coach, High School Soccer Coach (Oneida School District), Middle School Soccer Coach (Scott County School District), and Homebound Teacher.

Other Activities

In-School Collaborative Initiatives and Leadership
Teacher Evaluator for Oneida Special School District
Mentor of University of Tennessee Interns in Science and Math
Science and Math Resource Teacher
Appalachian Rural Systemic Initiative (ARSI) Teacher Leader
Regional Appalachian Math and Science Partnership Mentor

School-Community Collaborative Initiatives and Leadership
Served as a founding Board member of the South Fork Watershed Association
Community Science and Math Liaison for Oneida Special School District through ARSI program

In-services, Workshops, or Conferences Conducted

National Teacher's Enhancement Program (NTEP) II, Funded through Fermi Laboratory– Planned and facilitated an online program for science/math teachers' developing online inquiry lessons.

Designed and facilitated a program on inquiry *Engaged Learning: A Collaboration of Oak Ridge National Laboratory and Oneida Special School District.*

Designed and facilitated a program for Benton County School District Camden, Tennessee mathematics teachers on the standards and assessments in Tennessee. *Mathematics: A change for the better in Tennessee*

Designed and facilitated a one year teacher and administrator program to "Train the Trainer" for the Understanding by Design project, this program involved five school districts.

High School Math and Science In-service: Developing a framework built on standards.

Designed and implemented summer science enrichment programs as a partnership with Big South Fork National River and Recreation Area (BSFRRA) and the Oneida Special School District. Program gave students a summer experience as a working scientist and gave the Park Service needed data. Activities included studies on the effects of the ozone on the lichens in the area; designing and writing a trail guide booklet; and conducting studies on water quality and wood ducks in the park.

Designed and implemented a 21st Century Grant for Promoting Reading & Inquiry through Science and Math (PRISMS) Workshop for 95 teachers from a five-district area. The three-day institute concentrated on the use of inquiry, literacy, manipulatives and integrating activities for math and science into the elementary and middle school classroom.

Co-Presented with Dr. Patrick Weaselhead a session on professional development at the 1998 Science and Mathematics Education Leadership Institute for Systemic Reform (Washington, DC).

Designed and implemented in-service program for elementary schools.   Programs have included National Standards of Mathematics, inquiry, use of assessments as a diagnostic tool, use of mapping to align the curricula and use of math manipulatives in the classroom. Also served as science consultant for the Project REAL, Ohio as a Program Improvement Review team member.

Responsible for the planning, implementation of Summer Science Academy, Exploring Mammals for State of Kentucky Department of Education. Facilitate the week long program provides modeling and instruction to Kentucky teachers on science inquiry, reading strategies, and materials for outdoor activities for students.

Served on the planning committee for both the ASRI Summer Academy for Principals and ASRI Summer Academy for Teacher Partners. Involved with the entire formatting and activities for both events. Participated as a facilitator for the inquiry session.

Papers   Hausman, C., Shaeffer, J. & Shoemaker, B. (2014). "An Evaluation of Academic Coaches In the Salt Lake City School District" Program Evaluation. Salt Lake City School District. Salt Lake City, Utah.

Hausman, C. & Shoemaker, B.(2014). "PLANTING SEEDS: Teacher Development for Engaging 21st Century Learning & Inspiring Careers" Program Evaluation. Thomas More College, 333 Thomas More Parkway, Crestview Hills, KY 41017

Presentations

2001   Sanchez, S., Shoemaker, B., Gourneau, J., & Carson, R. *Strategies for Building Teacher Support Networks*. (March 8-10) Presented at the NSF Rural Systemic Initiative Lead Teacher Conference, Albuquerque, NM.

2001   Teacher's Panel Discussion, Rural Systemic Initiatives, NSF Principal Investigator/Project Director Conference, New Orleans, Louisiana

2004   Shoemaker, B. *We Got the Grant - The Good News and Bad News: Issues with Administering Grants Panel Discussion*. The Central Appalachian Mathematics and Science Summer Academy. Meadowview Conference Resort, Kingsport, Tennessee.

2006   Kidwell, K. & Shoemaker, B. *Using Formative Assessments to Improve Student Achievement,* (November 1-2). 3rd Annual Leadership Academy, Meadowview Conference Resort, Kingsport, Tennessee.

Yopp, J., Shoemaker, B., & Royster, W. (2006, October 23-24). *Model for Institutional Collaboration with School Districts: The Partnership Enhancement Project (PEP) Program of AMSP.* Presentation at the CPE Teacher Quality Summit, Louisville, KY.

2007   Yopp, J.,Shoemaker, B., & Peach, H. (2007, October 29-30). *Teacher Needs for Math & Science Education Reform and Their Implications for Teachers & Schools*, 2007 Technology, Teaching and Learning Conference, Maysville Community & Technical College, MCTC Rowan Campus.

Yopp, J., Peach, H., Poulette, J., Long, D., Shoemaker, B., Evans, B. & Henderson, S. (2007, October 29-30). "Listening to Partners for Math & Science Education Reform – AMSP District Needs Study". Presented at the CPE Teacher Quality Summit, Louisville, KY.

National Science Foundation Working in Appalachia, Presentation for Dr. Arden Bement, Director of the National Science Foundation, Visit to Appalachia, University of Kentucky, Lexington, Kentucky.
Appalachian Mathematics and Science Partnership (AMSP) Needs Analysis Surveys: Methodology and Results. AMSP Research Conference, Radisson Plaza Hotel, Lexington, Kentucky.

2009   Royster, W., Yopp, J., Shoemaker, B., & Peach, H. *The Successful Partnership Enhancement Program (PEP) Model* in Applachian Schools. 2009 MSP Learning Network Conference, Washington, D.C.

Kutal, C., Pomeroy, D., Beardsley, L., Shoemaker, B., Zhang, X. *Engaging Higher Education Faculty in K-16 STEM Education Reform*.
(January 25-26) Math and Science Partnership Learning Network Conference, Research Findings in Teacher Education: New Approaces-Transformative Possibilities?. Washington, D.C.

2010   Yopp, J., Shoemaker, B., & Royster, W. *Partnership Enhancement Projects: An effective and successful K-12 and IHE Partnership Program.* STEM Symposium, First Annual STEM Education Conference Lexington, KY

2011   Shoemaker, B., McCardle, P., & Kegebein, R. *Partnership Enhancement Program: Teachers and Institutes for Higher Education (IHE) Faculty Using Data to Plan Professional Development*. STATS-DC 2011, STATS-DC Data Conference. Hyatt Regency Bethesda Hotel, Bethesda, Maryland.

Shoemaker, B., Yopp, J., & Royster, W. *Rural STEM Initiatives: Reaching and Learning from the Commonwealth and Beyond.* STEM Symposium, Second Annual STEM Education Conference Lexington, KY

2012   Royster, D., Shoemaker, B., Wilhelm, J. and Yopp, J.H. 2012. *Evolution of a Partnership Enhancement Project in the Appalachian Mathematics and Science Partnership: Lessons Learned*. Presented at the Annual Mathematics and Science Partnership Conference at The Learning Network Meeting of NSF, Washington, D.C. January 19-22.

Shoemaker, B. & McCardle, P. *Building Partnerships – Characteristics of a Successful K-12 Higher Education Faculty Partnership.* (July 11-13, 2012) NCES 25th Annual STATS-DC Data Conference, National Center for Educational Statistics, Washington, D.C.

Shoemaker, B., Caldwell, J., Lee, C.,Peters, M.,& Royster, D. *Characteristics of a K12 and Higher Education Mathematics Engaged Partnership: Lessons for sustainability and vertical integration of mathematics in grades 6-12.* Third Annual UK STEM Symposium, Lexington, KY.

Shoemaker, B. *Characteristics of a Successful K-12 Higher Education Faculty Partnership: Lessons Learned and Best Practices from Appalachian Mathematics and Science Partnership (AMSP)* 2003-2012. (November 8-9) 2012 Kentucky Engagement Conference. Western Kentucky University, Bowling Green, KY

Shoemaker, B., Hatfield, D., Helm, D., and Toma, E. *Toyota Project: Lesson Study Project: Leaning Innovation to Motivate Young Math and Science Wizzes and Biology Realignment and Curriculum Enhancement (BRACE) at the Trace.* (November 29-30) Kentucky Innovation Summit, College of Education University of Kentucky. Lexington, Kentucky.

Grants

- National Science Foundation Local Systemic Initiative, South Fork Local Systemic Change (2000-2003), $200,000 for K-6 Science Initiative Co-Author and Project Director.
- National Parks Service, Parks as a Classroom, (2006-2007), $33, 365 for development of curriculum for grades K-6, Author and Project Director.
- Toyota USA Foundation Grant (2009-2013), $499,000 for K-12 Math & Science Outreach, Co-Author and Project Director.
- AT&T Foundation Grant, (2009-2010), $30,000 for K-12 Math Outreach, Co-Author and Project Director.
- AT&T Foundation Grant, (2009-2010), $24,000 for K-12 Math Outreach, Author and Project Director.

Honors

Phi Kappa Phi Honorary Society
Pi Alpha Xi Honorary Society

Delta Kappa Gamma Society
Alpha Zeta – Agriculture Honorary Society
Golden Key National Honorary Society

Professional Memberships and Organizations

National Science Teachers Association (Presently)
National Teachers of Mathematics Council
ASCD (Formerly known as Association for Supervision and Curriculum Development)

Community Service/Volunteer Organizations
AYSO Coach and Registrar
Girls Scout Leader
Oneida Garden Club
Summer Enrichment Programs
Appalachian Rural System Initiative Teacher Partner
Summer Enrichment Program, Oneida Middle School
Scott County Recreational Board
Scott County Department of Human Services – Foster Home Review Board
NEA/OEA High School and Middle School Representative
Ornamental Horticulture and Landscape Design Club
                (President 1986-1987, Secretary 1985-1986)
Member of Agriculture Student-Faculty Council
Pi Alpha Xi Flower Judging Team (University of Tennessee-Knoxville)
Girls Scout Leader
Oneida Garden Club (Secretary-Treasurer)
4-H Judge.

Hobbies and Personal Interests
Hiking (Appalachian Trail)
Gardening
Reading