

The Effects of Coaching on Teacher Efficacy, Academic Optimism and Student Achievement: The Consideration of a Continued Professional Development Option for Teachers

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Abstract

Adult learning suggests that coaching, where a teacher and coach work together through a cycle of planning, modeling and conferencing, is an effective method to increase teacher ability. For this study, a previously collected database was used to examine the construct of academic optimism which consists of three variables, teacher efficacy, trust in adults and students, and academic emphasis in relation to presence of coaching. A survey was given to teachers who had and had not been coached. Data mining was completed from public websites for district Annual Yearly Progress reports per No Child Left Behind mandates to determine changes in student achievement, which was a current measure when the data were collected. Findings indicate that teachers who receive coaching do have impact on positive change on student achievement. Professional development through coaching is significantly related to teacher efficacy, student achievement and teachers' belief that coaching increases their ability to impact student achievement..

Key Words: instructional coaching, student achievement, academic optimism, teacher efficacy

Introduction

The possibility of increasing teacher effectiveness is a driving force for school reform and change. While a school can be reformed by reorganizing the structure of the day, how students are placed in classrooms, or what curriculum is used to teach, the critical factor of school reform is the teachers' ability to positively impact student learning. Teachers spend the majority of the day with students and their impact on students makes a tremendous difference (Stronge, Ward, Tucker, & Hindman, 2008). Numerous studies link teacher effectiveness to student achievement (Darling-Hammond, 2000; Darling-Hammond, Holtzman, Gatlin, & Heilig, 2005; Darling-Hammond & Youngs, 2002; Peske & Haycock, 2006; Wayne and Youngs, 2003). Additionally, research indicates that lower performing students tend to be placed with less effective teachers (Stronge et.al, 2008).

Teacher coaching has been one form of professional development aimed at improving teacher pedagogy and teacher effectiveness for nearly 40 years. Joyce and Showers (1980), first proposed peer coaching as in-classroom professional development that reinforces the transfer of new skills from professional development to practice. Currently, coaching is used as professional development in large-scale initiatives for various reasons including the development of individual teachers' ability to meet student needs.

The factors that determine teacher effectiveness are numerous. One way to measure teacher effectiveness is by examining teacher efficacy, or how teachers perceive their ability to impact student achievement, and their academic optimism, which is their belief about how students will perform academically. Limited research has been done regarding the relationships between the self-perceptions of academic optimism and teacher efficacy with achievement of students, or how these constructs function for teachers who have not received coaching compared to teachers who received coaching.

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The continued drive in public policy and local school districts to increase student achievement suggests a need for understanding how professional development impacts teachers' belief in their teaching ability and the learning ability of their students. The purpose of this paper is to describe the results of a study conducted to understand the connection between teacher coaching as professional development and teachers' efficacy and academic optimism. This study contributes quantitative evidence to the growing body of research on instructional coaching. This study was conducted in 2011 to measure the connection between teacher coaching and student achievement. The data was recently re-examined to consider teacher coaching and the connection between coaching, teacher efficacy and academic optimism because coaching continues to be used widely by school districts for teacher professional development.

2. Context of the Study

Models of instructional coaching have been implemented in schools, grades K-12, for a variety of different reasons. In elementary school settings, considered in this study to be grades K-6, the coach's responsibility is usually to help the classroom teacher increase student skills in basic areas of literacy and mathematics. With the passage of No Child Left Behind (2001) students in grades 3-6 are tested in basic areas and the results of the test are used to measure the schools' effectiveness. Instructional coaching has been used as a professional development model to increase teachers' abilities to teach well, and therefore increase student achievement. This focus continues under Race to the Top with grades 3-6 tested using state accountability measures. The context of this study is therefore elementary education in grades 3-6.

3. Theoretical Framework

There are two conceptual theoretical frameworks related to the inquiry of this study: transformative and adult learning.

3.1 Transformative

The ontology of transformative methodology is that multiple realities are shaped by political, social, cultural, economic, ethnic, gender and disability values. This methodology includes an interactive link between the research and the participants, whereas the people who are the research participants are involved in the planning, analysis and use of the research. This is based upon the action research tradition. This methodology supports inclusion of diverse voices and viewpoints from minority groups within society (Gall, Gall, & Borg, 2006). The transformative paradigm emerged due to growing dissatisfaction with the dominant research paradigm, which based a majority of the sociological and psychological theory on the White, male perspective, which was not inclusive of gender, ethnic groups, or disabled populations. Sielbeck-Bowen, Brisolara, Seigart, Tischler, and Whitmore (2002) posit that knowledge and values are culturally, socially and temporally contingent. Critical self-reflection is necessary as the characteristic of the one who holds knowledge will influence the creation of knowledge. In other words, the participant interacts with the research to develop knowledge about the context, viewpoints, emotions and actions of participants.

Changes in the demographics and cultural competency of the overall population in the United States create a need for a more inclusive research paradigm (Gall et al., 2006). The Hispanic population is expected to triple between 1999 and 2030 making it the largest minority group in the United States and the African American population is expected to rise by 70%. The changes in demographics indicate a need for race-sensitive research. Quintana, Troyano, and Taylor (2001) suggest that researchers become aware of and apply indigenous theories to their inquiry in order to focus on culturally appropriate theories and models to inform inquiry. The methodology of the transformative approach requires an inclusion of qualitative methods to some measure, therefore mixed methods was used. A summary of a transformative study may include the following: evaluation problem, evaluation question, method, participants, instruments and procedures, results and discussion. The key to this paradigm is the focus on the evaluation problem, evaluation question, method, participants, instruments and procedures, results and discussion.

3.2 Adult Learning

In addition to the transformative paradigm adult learning theory is a foundational theory for the methodology of the study.

Adult learning, as identified by Knowles (1990), refers to motivation as that state when an adult is ready to learn things they need to know. In contrast, Wlodkowski (2008) suggested that adults needed to experience a gap in their competence in order to create a context and need for an adult to be motivated to learn. What is clear that within the opportunity to provide learning through staff development is that the focus is not on the teacher, but on the participant and his or her level of learning? Adult learning is known as andragogy, in contrast to child learning or pedagogy. Knowles (1984) explained andragogy as a set of theories around how adults learn and what motivates them to learn. Andragogy is a foundation for the consideration for different approaches to professional development and the consideration of the adult as the learner. One such approach is developing supportive, cooperative relationships to give adult learners opportunity for feedback (Wlodkowski, 2008).

Knowles (1984, 1990) considered learning along a continuum with pedagogy on one end and andragogy on the opposite end. He suggested that there is a point where instructors cease to apply pedagogical teaching methods and apply andragogical methods. While this stopping and starting point is not clear in the development of adulthood, what is clear is that adult learning theory must be considered within the research inquiry as often people automatically apply past experiences and assumptions about teaching to current situations (Conaway, 2009; Ellis, 1987). This study examines professional development, and specifically coaching, as adult learning and the theory of adult learning as a foundation for understanding the research questions.

4. Review of the Literature

Teachers' academic background, preparation for teaching, certification status and other experiences impact significantly their students' achievement levels (Darling-Hammond, 2010). The United States has lagging educational attainment and has not responded in the same manner as other nations that were previously low attaining.

The negative effects of an ineffective teacher continue into future years lowering students' academic achievement. Two or three ineffective teachers in a row compound the problem, resulting in significant deficits in student achievement (Darling-Hammond, 2009). The overall results of professional development can impact teacher capacity in content knowledge as well as in their efficacy beliefs. Recently researchers have begun to consider a new construct, academic optimism of teachers. This construct has potential to impact student learning because it measures teachers belief in themselves to impact learning, the teachers trust level in students and parents to engage with school work and the teacher press for academic learning.

4.1 Teacher Academic Optimism

Academic optimism is a latent construct that has been related to student achievement. Up to 2007, academic optimism had been researched as a property of the school, not of the teacher (Hoy et al., 2008). Academic optimism is made of three constructs: teacher trust, academic emphasis and teachers' sense of self-efficacy (Hoy, Tartar, & Woolfolk Hoy, 2006; McGuigan & Hoy, 2006). Academic optimism is the teacher's positive belief that he or she can make a difference in the academic performance of his or her students through the emphasis of teaching and learning, by trusting parents and students to engage in the process and by believing in his or her own capacity to overcome difficulties (Hoy et al., 2008). Hoy et al. (2008) set out to empirically show that academic optimism is an individual teacher characteristic. Previous to their exploratory study, academic optimism was considered only a collective measure of efficacy. In the past, teacher trust and academic emphasis were identified as having parallel meaning at the organization and individual level, while teacher's sense of self-efficacy was considered only at the individual level. The purpose of their 2007 study was to test the construct of academic optimism at the individual level. They also intended to identify predictors of teachers' sense of academic optimism.

Hoy et al. (2008) stated that academic optimism is more specific than the general optimism of teachers. Academic optimism is the teacher's positive belief that he or she can make a difference in the academic performance of his or her students through the emphasis of teaching and learning, by trusting parents and students to engage in the process, and by believing in his or her own capacity to overcome difficulties, and displays resilience and perseverance (Hoy et al., 2008). Tarter, and Woolfolk Hoy's (2006) earlier research focused on academic optimism at the school level, in the attempt to conceptualize and measure teachers' sense of academic optimism, they used the same theoretical base.

The construct of academic optimism is grounded in the theoretical perspective of positive psychology. Positive psychology explores optimal environments (Seligman, 2002). In contrast to humanistic psychology, positive psychology relies on empirical research to understand the human condition (Seligman, Steen, Park, & Peterson, 2005).

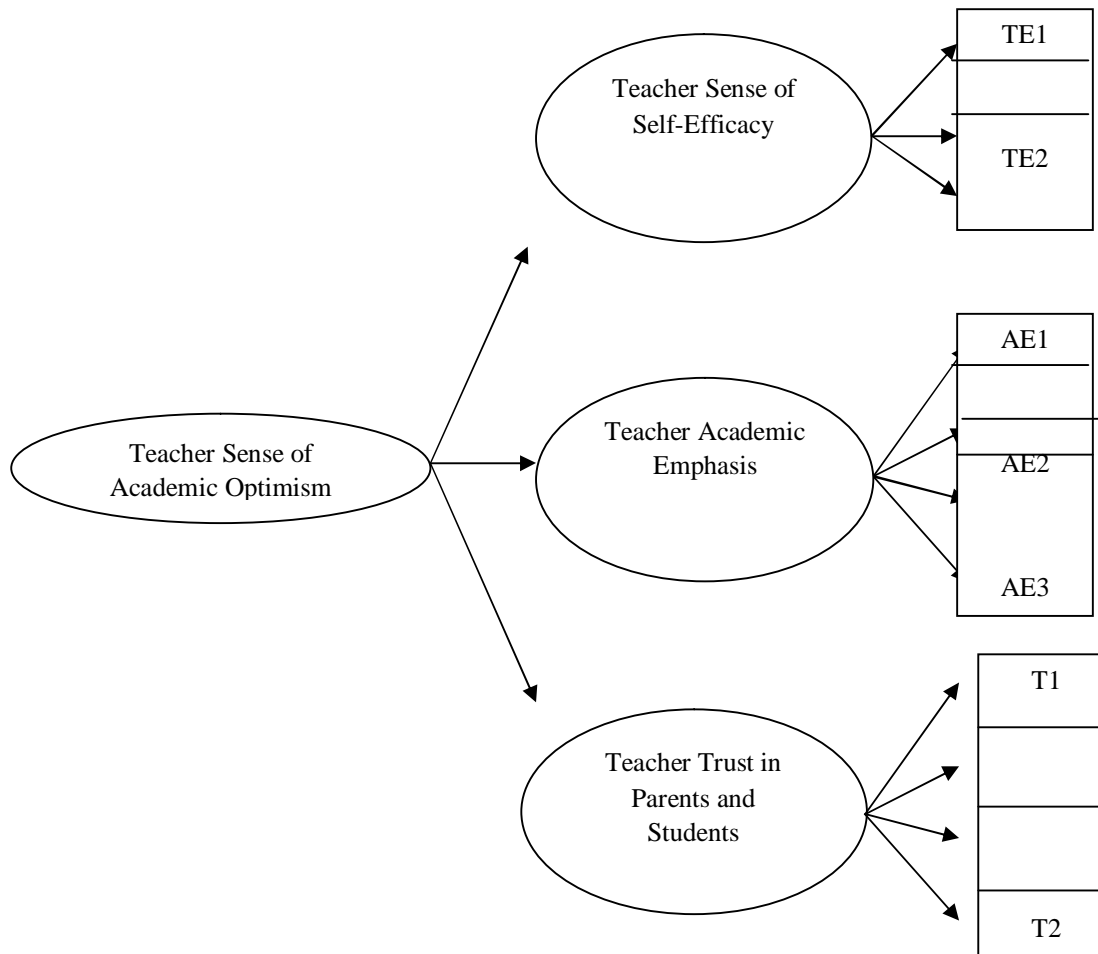
Seligman described a change in viewpoint of psychology from a point of what can go wrong with a person, to what can go right. This viewpoint includes a focus on optimism and explanatory style (Seligman, Steen, Park, & Peterson, 2005). Optimism stems from research on learned helplessness; whereas optimism is justified through expectations. Expectations are framed by an individual's expectancy of good event or bad events occurring (Seligman et al. 2005). Optimism is the antithesis of helplessness and is a way to increase personal control Seligman et al. (2005). Optimism underscores hope, responsibility, and a general positive disposition to life.

4.2 The Constructs of Teacher Academic Optimism

Beard et al., (2010) completed a pilot study to determine whether academic optimism was a viable construct at the individual level. The first construct, teacher sense of self-efficacy, was measured with a short form of the Teacher Sense of Self-Efficacy Scale (TSES) was used to measure teacher self-efficacy beliefs. The original tool, written by Tschannen-Moran and Woolfolk Hoy (2001) was comprised of 12 items each with a measure along a nine-point continuum from (1) indicating "nothing" to (9) indicating "a great deal." The higher the score indicates the higher the teacher's sense of self-efficacy.

The second two constructs teacher's trust in students and parents and level of teacher academic emphasis were measured with a new instrument Beard et al. (2010), designed. This tool, originally written by Tschannen-Moran and Woolfolk Hoy (2001), was comprised of 12 items each with a measure along a nine-point continuum. This pilot study included two challenges, first to develop operational measures for each element of academic optimism, and secondly to improve the individual measures of two variables, trust in parents and teachers, and academic emphasis (Beard et al., 2010).

In the design of the instrument to measure trust in parents and students, the items were grouped into two sets, one set to measure academic emphasis and one set to measure trust in parents and students. Four items in each set had high loadings (above .80) that formed a scale; both scales had alpha coefficient reliabilities of .87, resulting in two sets of four items measuring each construct. Trust in parents and students was measured using four Likert items, two measuring trust in parents and two measuring trust in students. Participants indicated agreement with the item using a continuum of strongly agrees (5) to strongly disagree (1). The third component, academic emphasis was measured using the other four items from the pilot study. Participants indicated agreement with the item using a continuum of strongly agrees (5) to strongly disagree (1). This model is represented graphically in Figure 1.

Figure 1: Hypothesized model of individual teacher academic optimism (Beard, Hoy & Hoy, 2010, p.1138).

4.3 Teacher Efficacy

Bandura's (1977) social cognitive theory and his construct of self-efficacy defined perceived self-efficacy as the beliefs in one's capabilities to organize and execute a course of action required to produce an outcome. Self-efficacy beliefs influence thought and emotions that enable individuals to expend and sustain substantial effort in the pursuit of their goals. Self-efficacy beliefs also guide the individual to persevere toward the goal in the face of adversity and rebound from setbacks. Additionally, self-efficacy beliefs guide individuals to exercise control over events that affect their lives (Bandura, 1986, 1997).

Guskey and Passaro (1994) defined teacher efficacy as "teachers' beliefs or conviction that they can influence how well students learn, even those who may be difficult or unmotivated" (p. 628). Teacher efficacy as a construct developed 21 years ago and since has undergone transformation and identification as researchers work to further define the construct (Tschannen-Moran et al., 1998). Teacher efficacy was conceived by the RAND researchers in 1976 with the research of Rotter's (1966) social learning theory as a foundation for the construct (Tschannen-Moran et al., 1998). The RAND researchers sought to define the extent that teachers believed they could control reinforcement of their actions. The RAND researchers added two efficacy items to the survey. These items focused on locus of control, or whether teachers believed reasons for student achievement lay within themselves or with the environment (Tschannen-Moran et al., 1998). The groundwork for this construct was laid by Brophy and Everston (1977) who studied effective teachers and the outcomes of their work. In the Texas Teacher Effectiveness Study, Brophy and Everston discovered that teachers successful in producing student learning gains tended to have higher expectations for students and took personal responsibility for student learning.

Furthermore, the teachers in the study viewed student learning difficulties as obstacles to overcome with appropriate teaching methods, rather than indicators that students could not learn. Brophy and Everston's (1977) research revealed a link between teacher behavior and student outcomes, with teachers who possess higher self-efficacy producing greater results through their teaching methodology. They did not label this construct teacher-efficacy, and researchers were uncertain of how to measure the construct. What was revealed, however, is the suggestion of an inadequacy in the system as it is possible that students exposed to low-efficacy teachers will learn less than from high-efficacy teachers.

Cantrell and Hughes (2008) showed the link between professional development and three constructs of efficacy, personal, general and collective. They identified professional development as including coaching, which was reinforced by research on effective professional development (Joyce & Showers, 1982, 1988; Ross, 1992). Another way of considering the construct of teacher efficacy is determining whether a type of professional development yields greater gains than others. Tschannen-Moran and McMaster (2009) examined the relationship between teacher self-efficacy and formats of professional development. They examined four different workshop formats to understand which format was related to increased teacher self-efficacy. Tschannen-Moran and McMaster (2009) postulated that it is important for researchers and school leaders to understand teachers' self-efficacy due to the role self-efficacy plays in teachers' implementation of new teaching methods and strategies. The majority of teacher change initiatives fail due to a lack of focus on teacher motivation and an understanding of change processes (Argyris & Schön, 1974; Guskey, 1986, 1998; Sarason, 1990). Teacher self-efficacy was found to be one of the most powerful influences on receptivity to change (Tschannen-Moran & McMaster, 2009).

4.4 Coaching Research

Sustained professional learning opportunities that are collaborative and classroom embedded support effective models of teacher learning which leads to student achievement gains as related to an increase in teacher quality (Bruce, Esmonde, Ross, Dookie, & Beatty, 2010). Smith and Rowley (2005) found that teachers are more likely to participate in professional development in schools with more collaborative environments.

Therefore, it appears likely that teachers are more willing to invest in their learning if they experience the professionalism that an organizational commitment requires (Smith & Rowley, 2005).

Peer coaching is a professional development strategy that improves teacher performance. Joyce and Showers (1980) first proposed peer coaching as in-classroom professional development model that reinforces the transfer of new skills from professional development to practice. Joyce and Showers (1980) completed a series of studies to test the hypothesis that weekly seminars would help the teachers being trained implement what they were learning. The weekly seminars were coaching sessions conducted by other teachers. The study showed that teachers who had regular sessions with another teacher where they planned together had higher rates of transfer of new learning than for participants who worked alone to implement new practices (Showers, 1985).

Coaching provides additional formal and informal support for teachers to expand the responsibility of instructional leadership beyond the principal (Taylor, 2008). There are various types and forms of coaching which vary in purpose, time and structure. While coaching can be formalized through a position, or be a process peers employ to help one another, or a professional development action taken by an administrator, all coaching has some similarities. Taylor (2008) suggested that instructional coaching has increased in popularity as a model of professional development because teachers' preservice education is often weak which, in turn, creates a need for strong in-service programs. Because most teacher professional development is made up of brief and incoherent activities, there is a need for strong peer coaching as professional development (Garet, Porter, Desimone, Birman, & Yoon, 2001). Coaching impacts professional development in multiple ways through embedding, extending, deprivatizing and connecting professional development to teacher needs (Taylor, 2008).

4.5 Coaching and Student Achievement

Ross (1992) conducted research to determine effects of teacher coaching on teacher efficacy and student achievement. The study examined mediating effects of teacher efficacy on coaching and achievement with a small sample (18 teachers) of grade 7 and 8 history teachers.

The research questions asked included: whether student achievement would be higher in classrooms of teachers who interacted more extensively with their coaches, if student achievement would be higher in classrooms of teachers with higher self-efficacy beliefs, and whether coaching and teacher efficacy would interact in that higher-efficacy teachers would benefit more from coaching than low-efficacy teachers. Teacher efficacy was measured in May with a self-report instrument developed by Gibson and Dembo (1984). Coaching was measured by a questionnaire measuring the perception of teachers on how they used the three personnel resources with respect to student outcomes, and an interview of teachers and coaches in June (Ross, 1992).

The first hypothesis of the study was confirmed: student achievement was higher in classrooms of teachers who interacted more extensively with coaches. The second hypothesis was also confirmed: that student achievement would be higher in classrooms with teachers who have high teacher efficacy. The third hypothesis was not confirmed due to the small sample size. No interaction between coaching, teacher efficacy and achievement existed. While this study did not confirm the hypothesis that coaching affects teacher efficacy and achievement, it appears that this relationship might exist.

Teacher efficacy, teachers' perception of their ability to positively impact student learning, accounts for differences in student achievement (Munoz & Chang, 2007). Therefore, it appears that professional development focused on increasing teacher efficacy would enhance teacher effectiveness. Coaching is embedded professional development and is one method for training teachers to implement instructional strategies that impact student learning. Additionally, in the last decade, coaching has become more prevalent as an improvement strategy in school reform.

4.6 The Research Questions

The study investigated the effects of coaching on teacher academic optimism and student achievement. The review of the literature about teacher efficacy, academic optimism, coaching and possible effects on student achievement lead to six related research questions. The seven questions are:

- 1) Is academic optimism higher for teachers who are coached than for teachers who are not coached?
- 2) Is teacher efficacy higher for teachers who are coached than for teachers who are not coached?
- 3) Is student achievement higher for teachers who are coached than for teachers who are not coached?
- 4) Do teacher efficacy, trust in students and parents, academic emphasis and the presence of coaching predict student achievement?
- 5) Do different coaching experiences predict student achievement?
- 6) Is there a difference in teacher efficacy between teachers with different levels of coaching experiences?
- 7) Is there a difference in student achievement between teachers with different levels of coaching experiences?

The focus of this research was on the effects of coaching on teacher perceptions about their efficacy and their feelings of optimism. The study used a database from a previously conducted study that looked at coaching and student achievement. The data measured the effect of the presence of coaching on student achievement as measured by the Academic Performance Index (API), which was a current measure when the data was collected. The API was the index determined by NCLB and was reported publically on state department of education websites. The original study, conducted in 2011, looked at whether the coaching was implemented in a district that experienced positive growth in student achievement as measured by the API. In considering teacher perception, we hypothesized that coaching would have a positive impact on teacher efficacy and academic optimism; in that professional development opportunities afford teachers opportunity to learn and grow in their profession.

5. Method

This study uses teacher self-reported data collected from teachers in four regions of the United States: the northeast region, the south, the Midwest and the western region. Additionally, the study examined archival student achievement data available on state department websites related to the accountability measures of No Child Left behind Act of 1999. The data were collected in 2011 based on teacher experiences the previous school year, 2009-2010. The sample included teachers from 11 states, teaching in systems that provided teacher coaching, however, the teachers in the survey may, or may not, have received coaching during the previous school year. The sample was collected through district or state level contacts that distributed the surveys to teachers in their systems. The identity of the teachers was unknown, unless they chose to participate in the focus group interviews, then the teacher self revealed name and contact information.

The teachers taught in grades third through sixth grade setting during the 2009 school year. The participants taught in urban, suburban and rural schools. Of the total respondents, a large majority of respondents were female, 183 participants were female, and 84 were male. Of the ethnicities represented in the sample, the majority of respondents were Caucasian (65.4%). The next largest ethnicity represented was of Hispanics (14.7%). Of the 217 respondents, 145 stated they received some type of coaching in the 2009-2010 school year (66.8%), 58 stated they have not received coaching (26.7%), and 14 declined to state (6.5%). The teachers taught in urban, suburban and rural schools in grades third through sixth grade setting during the 2009 school year.

5.1 Data Collection Procedure

Responses to the survey were collected from January through April 2011, and participants were to reflect on their coaching experiences from the previous school year. Participation was voluntary. First, a contact at a county office, district office or school leadership agreed for the teachers to participate in the survey and that person distributed the survey. The survey could have potentially been sent to 120 schools, but the school, district, or county office contact did not indicate in their communication, the number of schools in their districts which they submitted the survey. The survey was sent out electronically. The principals or district office personnel were not asked how many teachers were invited to participate in the survey in order to gain compliance of the school or district to participate, and also to maintain confidentiality.

5.2 Measures

5.2.1 Coaching Instrument

As mentioned, academic optimism is a construct made up of three constructs, teacher efficacy, teacher trust in students and parents, and teacher academic emphasis. Two types of instrumentation were used in this study: a survey of attitudes toward teacher optimism, efficacy and coaching, and data-mining through district and county websites for annual yearly progress (AYP) reports.

The survey included items to measure each of the three constructs of academic optimism. The survey was designed with items from Tschannen-Moran and Woolfolk Hoy's (2001) short form of the scale of teacher efficacy and the new construct designed by Hoy et al., (2008) designed to assess teachers' academic optimism. Beard et al. used these instruments to confirm the construct of teacher's academic optimism in 2010. Academic optimism is a construct that includes teacher efficacy, teacher trust in students and parents, and academic emphasis. Teacher self-efficacy was measured with items from the short form of the teacher efficacy scale. The short form consisted of 12 items assessing on a 9-point continuum. The scale includes three 4-item subscales including efficacy for instructional strategies, efficacy for classroom management, and efficacy for student engagement (Tschannen-Moran & Woolfolk Hoy, 2001).

Teacher trust was measured using items identified in Hoy, Hoy, and Kurz's (2008) exploratory study. Four Likert items measured teacher trust in parents and students. Two of the four items focused on teacher trust in parents, and two items focused on teacher trust in students. This scale was based on the *Omnibus T-Scale* faculty trust in clients subtest (Hoy & Tschannen-Moran, 2003). A Likert scale measured teacher trust. Participants indicated their agreement on each item from 1-strongly disagree to 5- strongly agree, with the higher score indicating higher agreement with the item.

Academic emphasis was measured using items from the instrument designed in the exploratory research by Hoy, Woolfolk Hoy and Kurz (2008). The scale was developed from the *Organizational Climate Index* (Hoy, Sweet land, & Smith, 2002) designed to measure achievement press. Seven Likert items measured academic emphasis, indicating their agreement with each item from (1) strongly disagree; to (5) strongly agree.

Teachers' coaching experiences were assessed through 13 questions, six questions that rated the frequency of coaching, and six questions that measured the impact of coaching through the elements of the coaching cycle, and one open ended question. The coaching cycle is an important part of coaching work and includes these stages, preplanning, modeling, co-teaching, and reflection. The questions were measured on a five-point Likert scale, and included one opened-ended question describing a different rate or impact of coaching.

Frequency of activity were measured where (1) is equal to never, 2 is equal to once per month, 3 is equal to twice monthly, 4 is equal to at least once per week, and 5 is equal to more than once a week. The lower number indicates a lower frequency and the higher number indicates higher frequency. Teachers were also asked to measure their perceived impact of coaching was measured on a five point Likert scale ranging from (1) not applicable, (2) not at all, (3) sometimes, (4) often, and (5) a lot. Coaching experiences on the instrument were assessed by 13 questions, item numbers 29-41. The survey included five questions that rated the frequency of coaching, and seven questions that measured the impact of coaching through the elements of the coaching cycle including preplanning, modeling, co-teaching, and reflection. Of the participants that had been coached, the majority of the participants had been coached either once per month (26.3%) or weekly (22.6%).

Student achievement data were mined from public information databases after the survey was completed. Three years of data were examined in order to identify any trends that existed in the fall or rise of student learning achievement scores on state high stakes assessments as measured by the API. Although this method of data measurement did not connect coaching to individual teacher scores, it did allow for some analysis of the presence of coaching on student achievement. This method was chosen because it was not possible to access individual teacher scores.

5.2.2 Student Achievement Instrument

The second instrument for measuring quantitative results was the measurement of student achievement data. Annual Yearly Progress (AYP) scores were mined from public databases for each school represented by a participant in the survey. AYP scores are a high level score card, which rate schools according to a number of indicators as addressed in the federal mandate No Child Left Behind (2001). Because this type of student achievement data is not sensitive to individual results or fluctuations, the data were coded for change over three school years from 2007 to 2010. The codes ranged from 1-6, whereas 6 meant not applicable. The other codes included (1) no change, school did not meet AYP indicators, (2) no change, school did meet AYP indicators (3) slight change, school met a few AYP indicators, (4) some change, school met many AYP indicators, (5) significant change, school met more AYP indicators and (6) not applicable. The frequency for each code is displayed in Table 1.

Table 1: Frequencies of Codes for AYP Achievement

Code	Description	Frequency	Percent
1	No change, did not meet AYP indicators	34	15.7
2	No change, met AYP indicators	37	17.1
3	Slight Change	34	15.7
4	Some Change	62	28.6
5	Significant Change	23	10.6
6	Not Applicable	11	5.1
Missing		16	7.4
Total		217	100

6. Analysis

Different sets of analyses were conducted to investigate different research questions. The first analysis focused on addressing the first two research questions - *Is academic optimism higher for teachers who are coached than for teachers who are not coached?* And *is teacher efficacy higher for teachers who are coached than for teachers who were not coached?* To address the first question, the items measuring teacher academic optimism were measured and for the second question, only the items measuring teacher efficacy were analyzed. The third question - *Is student achievement higher for teachers who are coached than for teachers who are not coached?* – examined archival data and the results of the survey. For this grouping of research questions, the analyses consisted of *t-tests*.

The next set of research questions examined the questions focused on relationships between the constructs and student achievement. This was investigated through multiple regression analysis. The fourth and fifth research questions *Do teacher efficacy, trust in students and parents, academic emphasis and the presence of coaching predict student achievement?*

And *Do different coaching experiences predict student achievement?* tested the relationship between the dependent variables, teacher academic optimism, including its subscales of teacher efficacy, teacher trust in parents and students, and teacher academic emphasis. The model, see figure 1, describes the relationship of the constructs of teacher academic optimism.

In this analysis the subscales of teacher academic optimism results from the survey data were related to trend student achievement data as defined by AYP, which was a current reporting method at the time of the data collection.

The next set of analyses was conducted with ANOVA tests. To address whether there is a difference in teacher efficacy between levels of coaching experiences, a one-way ANOVA was conducted. The examination of the sixth question - *Is there a difference in teacher efficacy between teachers with different levels of coaching experiences?*—grouped coaching experiences into five levels with (1) indicating ‘no coaching experiences,’ (2) indicating ‘coached once per month,’ (3) indicating ‘coached twice per month,’ (4) indicating ‘coached once per week,’ and (5) indicating ‘coached more than once per week.’ An ANOVA was also conducted to address the seventh research question - *Is there a difference in student achievement between teachers with different levels of coaching experiences?*—which asked whether teachers with more coaching experiences have higher student achievement as measured by teacher perception of coaching, and by AYP results. A post hoc analysis was also conducted to determine pair wise comparisons.

7. Findings

7.1 Differences in Optimism and Teacher Efficacy between Coached and Non-Coached Teachers

Optimism was measured by participant scores on the scale for teacher academic optimism, which included the subscales of teacher efficacy; trust in parents and students, and teacher academic emphasis. To address the question of whether the dependent variable (teacher academic optimism) was affected by the independent variable (coaching), three subscales comprising the construct of individual academic optimism were examined and compared to the teachers’ self-reports of being coached or not being coached. The means indicated that there was no significant difference in mean optimism ($t=.37$, $df=193$, $p=.71$, $r^2 = 0.1\%$) between coached ($M=4.05$) and non-coached ($M=4.09$) teachers.

The second research question addressed whether teacher efficacy, as indicated by participant scores on the short form of the Teacher Efficacy Scale (TSES) (Tschannen-Moran & Woolfolk Hoy, 2001), is higher for teachers who are coached than for teachers who are not coached. To address the question of whether the dependent variable (teacher efficacy) was affected by the independent variable (coaching), the TSES was examined and compared to the teachers’ self-reports of being coached or not. The analysis indicated that was no significant difference in mean teacher efficacy ($t=.98$, $df=191$, $p=.32$, $r^2=0.5\%$) between coached ($M=7.16$) and non-coached ($M=7.30$) teachers.

7.2 Differences between Student Achievement for Coached and Non-Coached Teachers

The third research question predicted whether student achievement would be higher for teachers who are coached than for teachers who are not coached. Achievement was measured by AYP results and coded by amount of change from no change (1) to substantial change (5). To address the question of whether the dependent variable (student achievement) was affected by the independent variable (coaching) a t -test was conducted. Means and standard deviations appear in Table 13 and the t -test results appear in Table 12. There is significant difference in student achievement ($t= -2.44$, $df=194$, $p=.02$, $r^2=3.0\%$) with coached teachers ($M=3.33$) having higher student achievement than non-coached ($M=2.78$) teachers.

Table 2: Results of t-tests for Teacher Academic Optimism, Teacher Efficacy, and Student Achievement by Coaching Status

Dependent Variable	t	df	P	r^2
Academic Optimism	.37	193	.71	0.1%
Teacher Efficacy	.98	191	.32	0.5%
Student Achievement	-2.44	194	.02	3.0%

7.3 Relationship between Coaching, Teacher Academic Optimism, Teacher Efficacy, and Student Achievement

Research question 4 addressed whether teachers with higher academic optimism have higher student achievement. To address the question, a multiple regression analysis was conducted.

Teacher academic optimism (teacher efficacy, teacher trust in students and parents, teacher academic emphasis) and coaching were the predictors and student achievement was the dependent variable. The results of the regression analysis appear in Table 3. The analysis revealed that the model was significant ($F(4,174) = 8.24, p < .001, r^2 = .14$) and explains about 14% of the variance in achievement. Table 4 displays the unstandardized regression coefficients (B), intercept, and standardized regression coefficients (β), t values and probabilities for each value of the independent variables.

Table 3: Regression Analysis for Student Achievement by Teacher Efficacy, Trust in Parents and Students, Academic Emphasis, and Coaching

Model	SS	df	MS	F	p	r ²
Regression	60.27	4	15.07	8.24	<.001	.14
Residual	318.01	174	1.83			
Total	378.28	178				

Table 4: Regression Analysis for Student Achievement by Coaching, Teacher Efficacy, Trust, and Academic Emphasis

Question	Unstandardized Coefficients		Standardized Coefficients	t	p
	B	Std. Error	β		
Intercept	5.1	.92			
Teacher efficacy	.09	.14	.05	.63	.53
Trust in Parents and Students	-.43	.19	-.25	-2.34	.02**
Academic Emphasis	-.28	.19	-.16	-1.46	.15
Coaching	.62	.23	-.19	2.68	.01*

* $p \leq .01$ ** $p \leq .05$

The independent variable of teacher trust in parents and students ($t = -2.34, p = .02$) and coaching ($t = 2.68, p = .01$) significantly predicted student achievement, but teacher efficacy ($t = .63, p = .53$) and academic emphasis ($t = -1.46, p = .15$) do not.

7.4 Relationship between Coaching Experiences and Teacher Academic Optimism

To answer research question 5, a series of analyses was performed for each of the dependent variables (teacher academic optimism, and its subscales of teacher efficacy, teacher trust in parents and students and teacher academic emphasis) and the independent variables (each of the 12 questions on coaching). The first regression used teacher academic optimism as the dependent variable. Further regression analysis focused on the individual variables that make up the variable of teacher academic optimism, which includes teacher efficacy, trust in students and parents, and teacher academic emphasis. The first of these regression analyses revealed that the model did not significantly predict teacher academic optimism based on coaching amount or type ($F(12, 112) = 1.79, p = .06$, adjusted R^2 was .07), however the results were nearly significant, and the dependent variable accounts for 7% of the variance in teacher academic optimism, see Table 5.

Table 5: Analysis of Variance for Teacher Academic Optimism and Coaching Type

Model	SS	df	MS	F	p	Adjusted R ²
Regression	10.54	12	.88	1.79	.06	.07
Residual	55.08	112	.49			
Total	65.63	124				

Although the model was not significant, one of the variables, degree of improved student achievement from coaching, ($t = 2.31, p = .02$) did show significance for predicting teacher academic optimism. In other words, teachers who perceive that their students have higher achievement due to coaching, have higher teacher academic optimism. Table 6 displays the unstandardized regression coefficients (B), standard errors, standardized regression coefficients (β), t -values and probabilities for each variable.

The regression analysis for teacher efficacy revealed that the model did not significantly predict teacher efficacy based on coaching amount and type ($F(12,115) = 1.63, p = .09, \text{adjusted } R^2 = .06$), however the results were nearly significant. One independent variable, question 36, appears to significantly predict the dependent variable of teacher efficacy, see Table 7. Again, teachers belief that they have increased student achievement because they were coached, significantly predicted teacher efficacy ($t = 2.70, p = .01$).

The regression analysis for teacher trust in parents and students revealed that the model approached, but did not reach significant prediction of teacher trust based on coaching amount and type ($F(12,122) = 1.75, p = .06, r^2 = .147, \text{adjusted } R^2 = .06$). Although the model explained 6% of the variance in trust, none of the independent variables was significant. The regression analysis for teacher academic emphasis revealed that the model did significantly predict teacher academic emphasis based on coaching amount and type ($F(12, 118) = 2.22, p = .02, \text{adjusted } R^2 = .10$), and explained 10% of the variance in teacher academic emphasis, see Table 8.

Table 6: Regression Analysis for Teacher Academic Optimism by Coaching Survey Questions

Question		Unstandardized Coefficients		Standardized Coefficients	t	p
		B	Std. Error	β		
Intercept		4.93	.29			
Q29	Have been coached during 2009-2010 school year	.06	.09	.08	.67	.51
Q30	Time spent planning with coach	-.05	.10	-.07	-.50	.63
Q31	Coach modeled in classroom	-.10	.10	-.13	-1.07	.29
Q32	Coach observed teacher	-.02	.10	-.03	-.25	.81
Q33	Time spent reflecting on instruction with coach	.13	.10	.17	1.22	.23
Q34	Degree coaching changed teaching	-.11	.12	-.14	-.92	.36
Q35	Coaching increased confidence as teacher	.05	.13	.07	.39	.70
Q36	Degree improved student achievement from coaching	.27	.12	.38	2.31	.02*
Q37	Degree planned instruction with coach	.01	.10	.01	.06	.95
Q38	Degree coach modeled	-.04	.10	-.05	-.37	.71
Q39	Degree coached observed	.08	.07	.12	1.21	.23
Q40	Degree coach debriefed after teaching	-.03	.11	-.04	-.24	.81

* $p < .05$

Table 7: Regression Analysis for Teacher Efficacy by Coaching Survey Questions

Question		Unstandardized Coefficients		Standardized Coefficients	t	p
		B	Std. Error	β		
Intercept		6.56	.34			
Q29	Have been coached during 2009-2010 school year	.06	.11	.07	.56	.58
Q30	Time spent planning with coach	-.00	.12	-.00	-.03	.98
Q31	Coach modeled in classroom	-.16	.11	-.16	-1.36	.18
Q32	Coach observed teacher	.04	.12	.04	.32	.75
Q33	Time spent reflecting on instruction with coach	.16	.12	.17	1.23	.21
Q34	Degree coaching changed teaching	-.20	.14	-.22	-1.42	.16
Q35	Coaching increased confidence as teacher	-.01	.16	-.02	-.09	.93
Q36	Degree improved student achievement from coaching	.39	.14	.44	2.70	.01*
Q37	Degree planned instruction with coach	-.06	.12	-.07	-.50	.61
Q38	Degree coach modeled	-.00	.12	-.00	-.01	.99
Q39	Degree coached observed	.09	.08	.11	1.09	.28
Q40	Degree coach debriefed after teaching	-.11	.13	-.12	-.84	.40

* $p < .05$

Table 8: Analysis of Variance for Teacher Academic Emphasis by Coaching Survey Questions

Model	SS	df	MS	F	p	Adjusted R ²
Regression	14.51	12	1.21	2.22	.02	.10
Residual	64.20	118	.54			
Total	78.70	130				

7.5 Relationship between Coaching Experiences and Teacher Efficacy

To address whether there is a difference in teacher efficacy between levels of coaching experiences, a one-way ANOVA was conducted. Coaching experiences were grouped into five levels by respondents' self-reports, with 1 indicating 'no coaching experiences', 2 indicating 'coached once per month', 3 indicating 'coached twice per month', 4 indicating 'coached once per week', and 5 indicating 'coached more than once per week.' The means, standard deviations and sample sizes for teacher efficacy by level of coaching are reported in Table 26. The ANOVA results were not significant ($F(4,188) = .83, p = .51, \text{adjusted } R^2 = .004$).

7.6 Relationship between Coaching Experiences and Student Achievement

The seventh research question addressed whether teachers with more coaching experiences have higher student achievement as measured by teacher self-reports of levels of coaching and the student achievement data. Coaching experiences were grouped into five levels by respondents' self-reports, with (1) indicating 'no coaching experiences' and (5) indicating 'coached more than once per week'. The number, means and standard deviation for each level are reported in Table 28. In examining whether the dependent variable (student achievement) was affected by the independent variable (coaching level), an ANOVA was conducted with an alpha level of .05. The ANOVA results were significant ($F(4,191) = 3.75, p = .01, \text{adjusted } R^2 = .05$). The mean and standard deviations for each reported level of coaching are displayed in Table 9.

Table 9: Analysis of Variance of Student Achievement by Coaching Levels

Model	SS	df	MS	F	p	Adjusted R ²
Coaching Levels	29.46	4	7.37	3.75	.01	.05
Error	375.29	191	1.97			
Total	404.75	195				

A post hoc analysis revealed four significant pair wise comparisons and appears in Table 10. The pair wise comparisons indicate that there was no significant difference between teachers who were never coached and teachers who were coached daily on student achievement results. Teachers who were never coached had lower student achievement than either teachers who were coached once per month ($p = .006$) or coached twice per month ($p = .008$). On the other end of the scale, teachers who were coached daily had lower student achievement than teachers coached once ($p = .02$) or twice ($p = .02$) a month.

Table 10: Pair wise Comparisons of Post Hoc Analysis of Student Achievement by Coaching Levels

Pair wise Comparison	Mean Difference	p
Never Coached < Coached Once per Month	.77	.006
Never Coached < Coached Twice per Month	-.89	.008
Coached Daily < Coached Once per Month	-1.15	.02
Coached Daily < Coached Twice per Month	-1.27	.02

8. Discussion

The findings of this study offer insight to school districts' planning effective professional development for teachers and the impact of that professional development on student achievement. Professional development through coaching appears to be significantly related to teacher efficacy, student achievement and teacher academic emphasis. Coaching is also related to teachers' belief that coaching increases their ability to impact student achievement.

The study indicates that academic optimism is not significantly different by the presence of teacher coaching. This means that teachers who are coached do not have higher or lower means compared to teachers not coached, on the survey items measuring teacher academic optimism.

Since academic optimism at the teacher level is a new construct, confirmed by the Beard et al. study (2010), extensive research on variables that affect teacher academic optimism has not been conducted. It appears from this study, with a smaller sample size and a sample developed from volunteers, that academic optimism is not affected by coaching as professional development. While significant results were not found for the presence of coaching on teacher academic optimism, or between the levels and type of coaching and teacher academic emphasis, significant findings were found between teacher academic optimism and teacher efficacy for one question on the survey asking whether teachers believe coaching impacts student achievement.

9. Conclusion

The results indicate positive impacts of coaching on the emphasis teachers place on academics and their impact on student achievement at the school level; the findings indicate that coaching does not affect academic optimism, or teacher efficacy.

Additionally, teacher efficacy was not found to be significantly different for, or related to, the presence of coaching. Berman et al. (1977) defined teacher efficacy as "the extent to which the teacher believes he can affect student achievement" (p. 137). While the construct of teacher efficacy was conceived in literature in 1976, it appears in this study that teacher efficacy is not affected by coaching. While coaching was not significantly related to teacher academic optimism and teacher efficacy, it was significantly related to student achievement. Student achievement is higher in the presence of coaching. The relationship between coaching and student achievement has importance for the daily actions of school districts planning professional development opportunities and for teachers, districts can plan coaching as a way to help teachers positively impact student achievement.

In this study, higher student achievement was defined by positive change in AYP results over a three-year time period, which was a relevant measure at the time of the study, and provides important information still today. Student achievement was higher for coached teachers. Although change was not measured in this study, this finding may relate to Prochaska et al.'s, discussion of stages of change (2001). Stages of change indicate that perhaps teachers who are coached move through the stages of change and do not remain in the Contemplation stage (which is the stage prior to taking action) as do up to 40% of most organizations' populations do. If a teacher moves beyond the Contemplation stage, to Implementation, they would be more likely to implement teaching methods that positively affect student achievement.

Findings indicate that teachers who are coached once or twice per month have higher student achievement as determined by school level measures. This finding is similar to Shidler's findings in 2009 regarding teacher efficacy and higher student achievement than less specific coaching. The relationship between coaching and student achievement has importance for the daily actions of school districts planning professional development opportunities and for teachers, districts can plan coaching as a way to help teachers positively impact student achievement.

Terehoff (2002) stated that effective professional development for adults is not subject focused, but problem or performance focused. The findings of this study are interesting in that they show that teachers who need, or receive, daily coaching do not perceive they are more effective than those who receive no coaching at all. Terehoff stated that adults need to know why they are learning something and be treated by others as capable of self-direction. The quantitative and qualitative results indicate that daily coaching is less effective; this finding might be related to Terehoff's findings that teachers coached daily do not perceive that the coach feels they are capable of self-direction due to the less amount of time that exists in between coaching sessions for self-direction.

While significant results were not found for the presence of coaching on teacher academic optimism, or between the levels and type of coaching and teacher academic emphasis, significant findings were found between teacher academic optimism and teacher efficacy for one question on the survey asking whether teachers believe coaching impacts student achievement. It is clear that teachers believe that coaching helps to increase student achievement. This finding relates to Bandera's theory of triadic responsibility, where reciprocal determinism includes the personal factors of cognition, behavior, and environment (Bandura, 1986). In other words, what we believe in determines what we perceive. The findings of this study reinforce this theory in that teachers who were coached believed that the coaching helped them increase student achievement.

9.1 Impact of the Research

The findings of this study could possibly impact professional development occurring in school districts as districts continue to use shrinking resources effectively. The results indicate that coaching does matter for teachers and their belief that it helps them improve student achievement. Additionally, it appears that the amount and type of coaching an individual receives is important to the success of coaching as a professional development model. Because the ability of the coach to focus on adult development and build relationships with teachers is important, school districts using a coaching model may need to decide upon coach selection criteria and a coach-teacher matching process. It appears from the results of the study that it is important to focus coaching on meeting the needs of the teacher. Teachers involved in coaching that focused on their individual growth needs may have more positive coaching experiences which ultimately affects student achievement.

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