

Utilizing Action Research Projects to Create High Quality
Professional Development

by

Robert Slade Morlang

An Abstract

of a research study submitted in partial fulfillment of the
requirements for the degree of
Education Specialist
in the Department of Educational Leadership
and Human Development
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ABSTRACT

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The purpose of this study was two-fold. The study determined the effectiveness of specific instructional strategies through analysis of data generated through action research by a comprehensive suburban high school near Kansas City, Missouri. Quantitative data was generated through an experimental design that included experimental and control classes that were given identical pre-tests and post-tests over the same learning goals. The only independent variable in the design was the instructional strategy utilized. The dependent variable was the difference in post-test gains between the experimental and control groups. The continuation of the study included a review of literature focused on successful school improvement initiatives. The findings in the literature were compared to qualitative data from the action research project (anecdotal data from staff involved in the action research) for the second part of the study.

The quantitative data from the action research project indicated that specific instructional strategies had a measurable positive effect on student achievement. The qualitative data indicated that the participation of the case study school in the action research project compared favorably to the findings from the review of literature and is an effective model for school improvement.

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CHAPTER I
INTRODUCTION

One does not need to be in the field of education long to realize that school reform initiatives historically come and go and then often come and go again. The initiatives were typically research based but the schools often were not capable of overcoming the challenges that arose from the changes. Professional Learning Communities (PLC's) were a popular reform initiative at the time of this study. The leaders in the field of PLC's understood the reasons why passed reform initiatives had gone away over time and believed that if PLC's were implemented correctly they would stand the test of time and result in real and lasting school reform and increased student achievement. PLC's were based on very simple and basic principles that could be applied to more complex educational issues. At the foundation of PLC's were three basic questions a school should ask:

- 1) What do we want students to learn?
- 2) How we are going to determine if students have learned?
- 3) What are we going to do if students have not learned?

(DuFour et al., 2005)

A comprehensive high school in a suburb of Kansas City was maturing as a PLC and addressing these questions. The three essential questions of PLC's led to important and significant work taking place in the school. During the collaboration process a fourth question presented itself over time. That question was how do students learn best? Nationally a fourth question had developed also and that question was: what do we do if a student has already learned? This paper focused on the fourth question that developed in the case study school and the action research and school reform that resulted from this question.

The case study schools' fourth question led to the school contacting Dr. Robert Marzano author of several books including *Classroom Instruction that Works Research-Based Strategies for Increasing Student Achievement*. In this book Dr. Marzano identified and described instructional strategies proven to have the greatest effect size on student learning based on meta analysis research techniques of studies done on effective instructional strategies for 30 years prior. (Marzano, 2001) Through discussions with Dr. Marzano the case study school determined that a traditional one or two day workshop teaching the strategies was not going to result in the type of lasting and significant change desired. The school and Dr. Marzano

determined that an action research project was needed. During the action research project the school would test the effectiveness of the strategies using an experimental design that included an independent and dependent variable.

Statement of the Problem

The purpose of this study was two-fold. Initially the study determined the effectiveness of specific instructional strategies through analysis of data generated through action research by a comprehensive suburban high school near Kansas City, Missouri. Quantitative data was generated through an experimental design that included experimental and control classes that were given identical pre-tests and post-tests over the same learning goals. The only independent variable in the design was the instructional strategy utilized. The dependent variable was the difference in post-test gains between the experimental and control groups. The continuation of the study included a review of literature focused on successful school improvement initiatives. The findings in the literature were compared to qualitative data from the action research project (anecdotal data from staff involved in the action research) for the second part of the study. The research questions guiding the study were:

1. What did the action research project data indicate regarding the effectiveness of the instructional strategies?
2. What effect did the action research data have on school improvement and teacher ownership?
3. What role did the teacher leadership group play in the action research?
4. What role did administrative leadership play in the action research?
5. What role did the action research project play in teacher evaluation?
6. How can ceiling effect become less of a factor in future action research projects?

Questions one and six are most related to the quantitative data that resulted from the action research. Question one is clearly the student achievement data that resulted from the action research. Question six was necessary to the study because ceiling effect had a limiting effect on the data discussed in question one and is a critical component to the discussion of further studies of this nature. Questions two through five were most directly related to the comparison of the qualitative data to the review of literature.

Limitations

The study was limited to an action research project completed by a comprehensive high school located in a

suburb of Kansas City, Missouri. The study was limited by the participation of staff members in the action research project. The study was limited by the ceiling effect present in several of the action research projects completed by individual staff members.

Definition of Terms

For the purpose of this study, the following terms are defined.

Action research: research project based on scientific experimental design producing data to be used during teacher collaboration.

Ceiling Effect: statistical limitation that occurs during action research project when a high number of students earn a perfect score on the post test. This can be accounted for statistically.

Collaboration: time for staff members to meet and discuss the profession of teaching and overcome the tradition of teaching in isolation.

Effect Size: value derived through meta analysis that provides a quantitative value for the effectiveness of a specific instructional strategy. The greater the effect size the greater the effectiveness of the strategy.

Meta analysis: research method used to evaluate and combine all of the research done over time on a specific topic and deriving an overall quantitative value.

Professional Learning Communities: school reform initiatives based on providing teachers the opportunity to collaborate on all aspects of school that affect student learning.

School Reform: school initiative designed to increase student achievement that changes any aspect of how the school functions.

Second Order Change: significant changes to the practices of a school that require specific leadership qualities to occur. (Marzano, 2005)

Stockdale Paradox: name given to the duality of thought (unwavering belief that the objective will be completed, acute awareness of the brutal facts that suggest the objective will not be completed) exhibited by leaders of companies that moved from good to great. (Collins, 2001)

Teacher Evaluation: Performance Based Teacher Evaluation tool used by the district to evaluate and improve instruction.

Viral Approach: strategy for implementing school reform initiatives. Approach is to implement first with

those teachers with a great passion for the reform, in the event the reform is successful for them they will share with those colleagues they work closely with who in turn will share positive experiences with other colleagues ideally spreading to the majority of the staff.

Design of the Study

The design of the first year action research project involved teachers completing an action research project designed to measure the effectiveness of a specific instructional strategy on their student's achievement. Teachers chose an instructional strategy highlighted in the book *Classroom Instruction that Works Research-Based Strategies for Increasing Student Achievement*. Teachers were encouraged by the staff leadership team to do their action research utilizing one of the following strategies: non-linguistic, compare and contrast or summarizing/note taking. These strategies were encouraged because the research in the book indicated they were the ones with the greatest effect on student achievement. Another reason these particular strategies were encouraged was because they correlated well to the process standards students would be evaluated on when they took the state assessment.

An example of a project completed would be having students use a non-linguistic strategy to learn vocabulary. The teacher chose an objective or unit that he wanted to use for his action research. The teacher gave a pre test to all of his students who would be participating in the project. The teacher then used the non-linguistic strategy with all of his classes but one; these classes were the experimental group. The remaining class would be taught using traditional methods and this class would be the control group. Following the instruction for all groups a posttest was given. Pre test and posttest data was submitted to Dr. Marzano and he compiled the data into a final report. Twenty-five staff members participated in the first year action research project.

The following year a second action research project was completed by the school. The design of the second year project was still based on comparison of pre-test and post-test data but did not utilize a control group. All students involved in the project were instructed using the instructional strategy. Students were also asked to rate their perception of the effectiveness of the strategy prior to taking the posttest and how hard they worked when using the strategy. Teachers also evaluated the effort required to implement the strategy and their perceived effectiveness

prior to the posttest. The majority of the staff completed this action research project.

This paper not only evaluated the results of the data from the action research project but also discussed the effectiveness of this type of project as a method for implementing meaningful school reform. Meaningful school reform generally requires second order change, which is not easy and often is not achieved. Strategies attempted to overcome the challenges of second order change are discussed as well as suggestions for future projects of this type based on what the case study school learned through participation. Historically these types of reforms in education generally have not been meaningful enough to stand the test of time. Sharing the successes and struggles the case study school experienced with this project should help others who are undertaking school reform initiatives.

Chapter two of this paper will review the literature related to the guiding questions above. Chapter three will explain the methodology used in gathering the quantitative and qualitative data for this study. Chapter four will analyze the quantitative data that resulted from the action research project completed by the case study school and compare and contrast the findings from the literature with

the qualitative data from the case study school during the action research project and the maturation of the school as a PLC. Chapter five will consist of a discussion including summary, conclusions and recommendations.

CHAPTER 2
REVIEW OF LITERATURE

Chapter two is organized around the guiding questions of the research problem. There are several references to Collins (2001) that are used to compare practices that lead business to become world class to those practices which lead to greatness in schools. Two of Collins concepts that do not connect directly to the research questions but are directly related to PLC's and the "viral effect" utilized by the case study school need to be discussed prior to addressing the literature related to the guiding questions. In the book *Good to Great* Collins compares and contrasts two sets of companies. The first group of companies was called the Good to Great Companies; these companies outperformed the market over a specified period of time. The other group was called the Comparison Companies, these companies underperformed compared to the market over the same period of time. Collins found several distinct differences between the two groups of companies.

One difference was that the Good to Great Companies had a "Hedgehog Concept" or a unifying vision. Collins derived the Hedgehog title for this concept from the

essay by Isaiah Berlin "The Hedgehog and the Fox". In the essay people are divided into two groups Foxes and Hedgehogs. The Foxes do not have a unifying vision, they go several directions at one time and have many ideas. Foxes see problems as very complex. Hedgehogs have a unifying vision that enables them to approach challenges and dilemmas and simplify them based on how they fit into the very narrow and focused vision of the Hedgehog.

(Collins, 2001) The "Hedgehog Concept" and the essential questions of a PLC had several similarities.

Another difference between the two sets of companies is the "Flywheel". Collins uses the metaphor of a giant flywheel to describe what it takes to move from good to great. A mental image is created of a huge metal wheel that weighs several thousand pounds mounted on an axle and the wheel must be rotated as fast and as long as possible. Initially with just one person pushing, it would be very challenging to begin to move the wheel but as more and more people come on board and provide additional energy the wheel starts to move. As even more people come on board and provide additional energy the wheel will eventually be spinning with such great momentum that it would be very challenging to stop. The "Good to Great" companies did not become overnight

success stories, they developed a "Hedgehog Concept" that everyone put all of their energy into and overtime through a unifying effort they were able to get the "Flywheel" moving with such momentum it could not be stopped. (Collins, 2001) Comparisons were made between the "Flywheel" of Collins and the "viral effect" of the case study school.

Effective Instructional Strategies

Sagor (2003) defined action research as, "research done by and for the person taking the action on his or her own actions, so to inform their future actions." (p. 128)

Marzano (2003) described action research as a key component of meaningful staff development. He indicated that the actual implementation of an instructional strategy followed by critical analysis of its effectiveness may be the most effective staff development that can occur.

"Opportunities for active learning elaborates on the notion that teachers are able to apply the pedagogical knowledge they learn. The best application task they might engage in is to actually try out a particular instructional strategy. This means that they return to their classrooms and actually use the strategy in an action research environment-an environment in which they informally examine the impact of various strategies on student achievement." (p. 66)

Marzano, Pickering and Pollock (2001) identified nine broad teaching strategies that have been proven over time to have a positive impact on student achievement. Identifying similarities and differences and summarizing/note taking were the top two strategies in terms of effect size of the nine presented. Similarities and differences had an effect size of 1.61 and summarizing/note taking had an effect size of 1.00. Nonlinguistic representation was fifth on the list but the .75 effect size was very close to the .80 effect size of the third highest strategy reinforcing effort and providing recognition and the .77 effect size for homework and practice. (Marzano, 2001)

Identifying similarities and differences in concepts or ideas is a practice in which most people naturally engage. The ability to find patterns or similarities in ideas is at the root of learning for most people. (Gentners & Markman, 1994; Markman & Gentner, 1993a, 1993b; Medin, Goldstone & Markman, 1995 as cited in Marzano, 2001, p. 14)

Identifying similarities and differences demonstrated positive effects on student learning whether the teacher directed the comparisons or students underwent the practice. The fact that both practices resulted in

positive effects on student achievement supports utilizing both. Utilization of teacher directed comparisons generates more specific results than the variety of responses when student directed, both activities have appropriate applications in most classes. (Chen, 1996;Flick, 1992;Gick & Holyoak, 1980;Mason, 1994, 1995;Mason & Sorzio,1996 as cited in Marzano, 2001)

The research regarding summarizing indicates that the ability to summarize requires learners to delete some information, keep some information and substitute some information. The ability to delete, keep and substitute the correct information requires the ability to analyze information and see patterns. (Kintsch, 1979; van Dijk, 1980 as cited in Marzano, 2001)

Research indicates many psychologists support the "dual coding theory" when describing how information is stored in the brain and this theory supports utilization of nonlinguistic strategies as an effective instructional strategy. The theory is based on the belief that information is stored in the brain in both a linguistic form (statements) and in nonlinguistic forms (mental images or physical sensations such as taste, smell and touch). Traditionally students are presented information in linguistic forms. Research indicates that encouraging

students to develop their own nonlinguistic image increases brain activity and retention of both linguistic and nonlinguistic information. (Paivo, 1969, 1971, 1990; Richardson, 1983; Flanders, 1970 as cited in Marzano, 2001)

Utilizing Data for School Improvement

The review of the literature related to educational data reveals that careful consideration must be given to what data is collected and how it is used for it to be most effective in school improvement. In the book *On Common Ground* Douglas Reeves authored a chapter entitled *Putting It All Together: Standards, Assessment, and Accountability in Successful Professional Learning Communities*. Reeves focuses on three points. The first point is that most current standards established in schools will not lead to improved achievement and must become more rational, relevant, and focused. The second point is the role that common assessments need to play once effective standards are established. The third point discusses the accountability systems that must be in place to indicate the success of the adult behaviors and all other influences that affect student achievement. The third point will be reviewed in more detail as it applies most directly to the

action research project completed by the case study school.

Reeves in Dufour (2005) stated,

Even the best standards and assessment will undermine student learning if professional practices are subverted by counterproductive accountability systems. Despite pervasive complaints that accountability policies of federal and state government dominate school decision-making, there is a growing body of evidence that accountability can be constructive, comprehensive, and supportive of professional learning and student achievement. (p. 60)

Reeves outlined the necessary components of an effective accountability system that goes beyond standardized test results.

Effective accountability systems are not merely a litany of test scores; they also include three critical levels of information:

- Tier 1 indicators reflect typical accountability data, including test scores and other data required for external accountability. But if we stopped there, as too many schools do, we would not understand the causes of improved achievement. It would be as if we knew an obese student had lost weight, but we did not know if the causes were diet and exercise or anorexia and drug abuse. That is why effective school accountability systems include Tier 2 data.
- Tier 2 data are made up of measurable indicators that reflect professional practices in teaching, curriculum, and leadership.
- Tier 3 of this accountability system is a school narrative, allowing teachers and school leaders to provide a qualitative context for quantitative data-the story behind the numbers. Only with this system will accountability systems provide the appropriate context, allowing professional learning communities to explore both the causes and effects surrounding

improved student performance and professional practices." (p. 60)

In chapter 4 of this paper the action research project completed by the case study school was evaluated for its effectiveness as Tier 2 and Tier 3 data.

The premise of this paper was that most school reform initiatives are not lasting but that PLC's have the ability to stand the test of time. One of the arguments for PLC's overcoming this trend in education is that the members of the PLC are the experts related to that school. Through effective collaboration they can decide what initiatives will have a positive impact in their school and should be implemented and which should be avoided. The three essential questions of a PLC are always at the forefront when these discussions occur.

Involving all of the members of the PLC in these discussions ideally leads to their ownership in all initiatives the school undertakes. Conzemius and O'Neill (2001) share the following story that resulted from an action research project at the Tess Corners School.

The data-based reflection that began as part of a four-month research project is now standard practice at Tess Corners. The teachers will admit that sometimes 'it's a pain in the neck to collect the data,' but all agree that it helps them know their students better. They also comment that the team approach to data gathering and reflection is tremendously

valuable and claim that mutual support and collegial problem solving really help maintain their ongoing efforts on behalf of students. As teacher Janis Schwalbach notes, "We collectively buy into this. It's naturally aligned with how we think and what we believe." (Conzemius et al., 2001, p.51)

In chapter 4 of this paper the action research project completed by the case study school was compared to the Tess Corner project to see if similar teacher ownership occurred.

Eaker, DuFour and DuFour (2002) describe the culture of a PLC as always focused on learning and always looking for best practices via any resource whether it is reviewing literature or visiting other schools. The authors also describe that

These collaborative teams of teachers are rather skeptical. They recognize that while things may work well in one school it does not necessarily mean they will work equally well in another school. The essence of this cultural shift is that collaborative teams of teachers are building a culture of experimentation by engaging in active research. They are not content to accept the 'external' validation of researchers. They want practices to be 'internally' validated in their school, in their classrooms, with their students. (Eaker et al., 2002, p. 21)

Collins (2001) called the connection to this guiding question, "confronting the brutal facts." The research of the "Good to Great Companies" revealed a consistency in

dealing with challenges or set backs not observed in the "comparison companies." The companies that prevailed always maintained a commitment to prevail but at the same time honestly confronted the brutal facts of their current situation. Collins calls this duality the Stockdale Paradox. The name was generated following Collins conversations with Admiral Jim Stockdale who was a prisoner of war for eight years during the Vietnam War.

The lesson learned from Stockdale is that the success of people or organizations is not related to the presence or absence of difficulty but instead the way they handle the difficulties which are inevitable. Stockdale survived the torturous eight years by never losing sight that he would ultimately prevail and at the same time staying focused on the reality of his situation. Stockdale explained that the optimists were the ones who did not survive. Their false optimism would motivate them to believe that they would be out by Christmas and Christmas would come and go and then they would say they would be out by Easter and it too would pass. The continued disappointments would be their downfall.

Stockdale's seemingly conflicting belief that when dealing with challenges one, "must retain faith that you will prevail in the end and you must also confront the most

brutal facts of your current reality" (Collins, 2001, pp. 85-86) can lead people or organizations to come out of challenges stronger than they were prior to the experience. Chapter four will discuss the relationship between the Stockdale Paradox and school accountability systems.

Teacher Leadership in Action Research

Conzemius and O'Neil (2001) identify the importance of shared responsibility and shared leadership in successful school reformation projects. For the project to be successful teachers must be effective in leadership roles and this effectiveness results from teachers choosing the role they will fulfill. In order for implementation to be successful, choice is also essential in the reformation project or change that will be attempted. Projects that are researched and chosen by staff are more likely to succeed than those that are mandated or projects in which they are unfamiliar. Conzemius and O'Neil do not discredit the importance of positional leadership but believe there is danger in the project depending too much on a particular leader. Reform projects with the highest probability of success are those that have groups of teachers who can lead the initiative. Significant and meaningful change needs

leaders that are independent of a leadership title.

(Conzemius et al., 2001)

According to Warwick (1995),

The primary responsibility of school leaders is to work on their systems. They need to educate teachers in group-process skills and decision making, for when people do not work well together they waste time, and the cause of system reform is set back. Only leaders can pull everyone in the system into the process. Improvement cannot be left to voluntary action. It is required of everybody. (p. 156)

The importance of teacher "buy in" continued to be stressed in the work of Painter and Valentine (2004). They explained that teachers are often asked to implement improvement plans that they did not have any voice in developing and may not support or may not be knowledgeable of the plan. Typically this does not lead to successful implementation. When teachers are invited or expected to be involved as leaders in the plan they will have more ownership and be more dedicated to the success of the plan. (Breaking Ranks II, 2004)

Getting the right people on the bus and getting the wrong people off of the bus comes before anything else if an organization wants to make the jump from good to great according to Collins (2001). When organizations have the right people on board, people management issues will not occupy as much time and their self-motivation for greatness

will result in a vision of the right work to be done. If the wrong people are on board the right vision regardless of its appropriateness will likely not be achieved.

Administrative Leadership in Action Research

Conzemius and O'Neil (2001) discuss the importance of positional leaders in effective reformation projects. Several researchers have documented the importance of strong positional leaders at the building and district level. These positional leaders play a vital role in promoting and supporting the change and provide the energy to overcome the obstacles that occur in any significant change.

Lambert (2003) indicates that an effective school leader demonstrates emotional intelligence. "The emotionally intelligent principal is self-motivating and empathetic, persists toward the goal of educating all children, manages his emotions and stress so as not to lose sight of his core values and commitments, and perhaps most importantly, holds on tightly to hope. These individuals are able to create organizational climates of trust, information sharing, healthy risk-taking, and learning." (Lambert, 2003, p. 44)

According to Warwick (1995) school leaders must be on the teams that are created if a sense of shared responsibility

and leadership is desired. Morale and efficiency will suffer if the positional leaders do not participate. The role of the positional leader is to support planning of the project, the implementation of the project, the analysis of the effectiveness of the project and supporting necessary adjustments based on findings. Positional leaders do this by supporting action research and pilot programs.

Marzano, Waters and McNulty (2005) discuss the differences between first order and second order change. The discussion centers on the tradition that someone is always looking to change education and many initiatives have been tried and abandoned. Often the initiatives that have been abandoned were research based and were the correct work to consider. The authors have come to the conclusion that in many of the cases leadership did not have the ability to deal with the magnitude of the change and that is what led to the ineffectiveness of the initiative. First order changes are those changes that are incremental and for which normal and traditional thinking and practices can be used. Second order change is a deeper change that requires different kinds of thinking and practices and is often met with resistance. The authors outline twenty-one responsibilities that must be in place for effective day-to-day management of a school and first

order change initiatives. In order for second order change to occur and last, the list of responsibilities for leadership is shorter but more imperative. Leadership must be able to do the following for second order change initiatives to be successful:

1. Knowledge of Curriculum, Instruction, and Assessment
2. Optimizer
3. Intellectual Stimulation
4. Change Agent
5. Monitoring/Evaluating
6. Flexibility
7. Ideals/Beliefs

(Marzano et al., 2005, p. 70)

The authors also warn that when second order change is attempted there are four responsibilities of leadership that will likely be perceived as deteriorating:

1. Culture
2. Communication
3. Order
4. Input

(Marzano et al., 2005, p. 73)

The perceived deterioration has been addressed by researchers, "the more accustomed one becomes to dealing with the unknown, the more one understands that creative breakthroughs are always preceded by period of cloudy thinking, confusion, exploration, trial and stress; followed by periods of excitement, and growing confidence as one pursues purposeful change, or copes with unwanted

change" (Fullan, 2001; as cited by Marzano et al., 2005, p. 74) Additionally, "the inclusion of competing value perspectives may be essential to adaptive success." (Heifetz, 1994; as cited by Marzano et al., 2005, p. 74)

Another example of research regarding how second-order change can be messy was credited to Fullan (1993) by Marzano, Waters and McNulty (2005).

"Ready, fire, aim" is the more fruitful sequence if we want to take a linear snapshot of an organization undergoing major reform. Ready is important; there has to be some notion of direction, but it is killing to bog down the process with vision, mission, and strategic planning before you know enough about dynamic reality. Fire is action and inquiry where skills, clarity, and learning are fostered. Aim is crystallizing new beliefs, formulating mission and vision statement, and focusing strategic planning. Vision and strategic planning come later. (p. 74)

Fullan (1993) concludes, "those individuals and organizations that are most effective do not experience fewer problems, less stressful situations, and greater fortune, they just deal with them differently." (p. 74)

Collins (2001) research of the effective vs. ineffective companies resulted in a clear correlation between the success or lack of success of the companies based on those individuals in the organization with positional authority. Collins describes the leaders of the "Good to Great

Companies" as Level 5 leaders. Level 5 leaders demonstrate a dedication to long-term greatness for the organization while maintaining individual modesty they facilitate long-term greatness by constantly identifying and developing their own successors. Level 5 leaders follow a pattern that Collins describes as "the window and the mirror". They look out the window when success for the organization occurs and provide credit to the others on board that were instrumental to the success and at times even credit good luck. They look in the mirror when set backs for the organization occur and never blame others or bad luck.

Action Research and Teacher Evaluation

Reeves (2004) discussed accountability and the prevailing belief that the way to hold teachers accountable is through student test scores on standardized tests. The dependence on test scores as the accountability tool of teacher effectiveness causes resentment in teachers who know that test scores cannot measure all of the positive teaching and learning that takes place in their class. According to Reeves, there are two choices that educators have regarding the current accountability system. Educators can continue "hoping that standards and testing are a passing fad, or we can lead the way in a fundamental reformulation of

educational accountability. We can wait for policymakers to develop holistic accountability plans, or we can be proactive in exceeding the requirements of prevailing accountability systems." (Reeves, 2004, p.5-6) Reeves continues, "If teachers systematically examine their professional practices and their impact on student achievement, the results of such reflective analysis will finally transform educational accountability from a destructive and unedifying mess to a constructive and transformative force in education." (Reeves, 2004, p.5-6)

Reeves provides specific details on how teachers can improve accountability systems if they embrace the idea. A more holistic approach to accountability can be implemented that does not depend entirely on test scores. A holistic approach would include a variety of educational variables and analytical methods and would be more comprehensive, fair and constructive. According to Reeves,

A comprehensive approach to accountability includes not only a focus on *effect* variables, such as test scores, but also a deep understanding of *cause* variables. If teachers wish to transform accountability from a set of policies 'done to' teachers and students to a constructive influence on teaching and learning, then teachers must take the lead in the systematic documentation of their practices in teaching and curriculum, and the relationship of those practices to student achievement. (Reeves, 2004, p.50)

Reeves adds, "teacher leadership in accountability includes the following elements: (1) observation, (2) reflection, (3) synthesis, and (4) replication. Each of these elements is essential, and a holistic accountability system is incomplete without all four." (Reeves, 2004, p. 50)

Following is a summary of each of the essential elements of a holistic accountability system discussed by Reeves. Teachers who practice *observation* in the sense that Reeves is discussing are highly aware of how effective they were with their intended practice and at times are overly critical of themselves. Positional leaders and colleagues of these teachers need to encourage and support teachers who evaluate their shortcomings so critically. *Reflection* occurs when teachers not only are critical of their own practices, they also receive or seek out critical feedback from colleagues. Participation in *reflection* can lead to differentiating instruction that teachers like from instruction that is effective. *Synthesis* adds a quantitative element to the accountability system and replaces personal preferences with fact. The final component of this type of accountability is *replication*. *Replication* is the commitment to copy or replicate those practices that are known to be effective. (Reeves, 2004)

In *Breaking Ranks: Changing an American Institution* (1996) teachers are encouraged to be, "adept at acting as coaches and as facilitators of learning to promote more active involvement of students in their own learning." (p. 23)

Ceiling Effect in Action Research Projects

Ceiling Effect occurred in the case study schools action research project because in several of the studies several students scored a perfect score on the post-test. With so many students scoring a perfect score it makes it difficult to know if the students could have demonstrated an even greater understanding of the learning goal and thus provide greater evidence that the strategy implemented was even more effective. In order to design an action research project that has minimal ceiling effect the depth of knowledge evaluated by the pre-test and post-test should receive careful consideration. When discussing teachers that are accountable for their instructional practices and practice critical observation Reeves observed, "they know that students this year have received more frequent feedback than was the case last year, and they know that students have been challenged to think, analyze, reason and write more frequently than last semester. The moments when

these pedagogical advances happen are neither accidental nor serendipitous, but are the deliberate result of careful professional practice." (Reeves, 2004, p.51)

There are common threads throughout the educational literature that are necessary for successful school improvement to occur. Many correlations can be drawn between the literature specific to schools and the concepts of the good to great companies. Chapter three will discuss the methodology used to gather the quantitative data on effective instructional strategies and the qualitative data gathered to compare with the review of literature.

CHAPTER 3

METHODOLOGY

The purpose of this chapter is to describe the methodology of the action research project completed by the case study school and the gathering of the qualitative data that was compared to the reviewed literature. The action research project was a three-year project culminating in an instructional strategy handbook generated in house that will be referenced by teachers in the building well past the initial three years.

Twenty-Five teachers who voluntarily participated completed the first year action research of the project. The design of the first year action research project involved teachers choosing an instructional strategy that they wanted to utilize in their classrooms. Data was then gathered to determine the effectiveness of that instructional strategy. An example would be having students use a non-linguistic strategy to learn vocabulary. Teachers chose an objective or unit that they wanted to use for their action research. The teacher gave a pre test to all of their students who would be participating in the project. Teachers then used the non-linguistic strategy with all of their classes but one; these classes were the

experimental group. The remaining class would be taught using traditional methods and this class would be the control group. Following the instruction with all groups a posttest was given. Pre test and posttest data was submitted to Dr. Marzano who compiled the data into a final report.

Fifty classes were part of the first year action research project involving 1,343 students (712 students in experimental classes and 631 in control classes).

Year two of the action research project was designed by the teacher leadership group in cooperation with Dr. Marzano and participation was expected by all teachers in the case study school. Teachers selected an instructional strategy to use in their classes during a portion of an instructional unit. To determine students' knowledge gain each teacher administered a pretest and a posttest of the content covered during the time in which the instructional strategy was used. Additionally, each teacher rated himself or herself on the use of the strategy using a four-point scale ranging from a high of 4 to a low of 1. A score of 4 on the scale indicated that the teacher understood the strategy, created an effective plan, and fully implemented the plan. A score of 1 indicated that the teacher either did not understand the strategy well or did not have a

clear plan for implementing the strategy. Finally, students in each class rated themselves in three areas: how hard they worked, how much they paid attention, and how much they learned. A four-point scale ranging from a high of 3 to a low of 0 was used for these ratings.

The qualitative data from the study came from discussions that occurred in a variety of venues before, during and after the case study school's action research project. The teacher leadership group met often throughout the entire action research project. During the action research project there were several cross curricular meetings that occurred as in house experts on various strategies met with less knowledgeable colleagues to design projects. Following individual teacher projects teachers shared their stories as part of the faculty meeting agenda. The creation of the in house instructional manual was another arena for the telling and documentation of the stories. Staff from the school presented at national and state conventions and the power point presentations they utilized were another record of the qualitative data. Yet another venue for the stories was a video created by the school that was also used in presentations and during visits to other schools who were interested in taking on a similar project.

Chapter four consists of discussion of the data collected via the methodology discussed in this chapter. The quantitative data will be analyzed and the qualitative data will be compared to the findings reported in the chapter two review of literature.

CHAPTER 4

FINDINGS

This chapter will be organized around the six guiding questions of this study and will compare the data gathered via the methodology discussed in chapter three and the review of current literature. The quantitative data alone that resulted from the action research project in the case study school made a strong case that this is the right type of work for schools to do if they are looking for school reform that will positively impact student learning. The action research done by the case study school provided quantitative data that utilization of the instructional strategies improved student learning within that specific school. The qualitative information that also resulted from the case study school's participation in the project was at least as important as the quantitative data and members of the case study school staff and a review of the literature made an argument that it possibly was more important.

Prior to the guiding questions in Chapter Two there was discussion of two concepts from *Good to Great* that did

not fit neatly into the guiding questions but were overall concepts to the case study schools experiences. These ideas were the "Hedgehog Concept" and the "Flywheel."

The case study schools Hedgehog Concept was the three essential questions of a PLC along with the addition of the school's fourth question. The school's focus on these questions provided clarity of purpose that generated the necessary motivation to take on the type of reform they underwent and the will to overcome any challenges that arose.

One of the earliest steps in the project was to train teachers on the instructional strategies that would be implemented. The training on the strategies was conducted by Dr. Debra Pickering and through discussion with Dr. Pickering the idea of implementing this reform with a "viral approach" was discussed. The thought was that if a few teachers became experts on these strategies and experienced increases in student achievement in their classes they would then share the ideas with those they worked closely with who would then share with others until the majority of the staff was "infected" with the belief in the strategies. The "viral approach" of the case study and Collins "Flywheel" are different metaphors for the same dynamic experience by the case study school.

The following information is the quantitative data that resulted from the case study school's action research project. This data addresses research question one: "What did the action research project data indicate regarding the effectiveness of the instructional strategies."

Figure 1: Findings for Individual Teachers

Teacher #	Strategy	Adjusted Exp Mean	Adjusted Control Mean	Prob	Exp N	Control N	Corr	Ceiling	Effect Size	PGAIN
1	Graphic Organizer	82.49	78.63	.28	44	15	.15	N	.29	.12
2	Nonlinguistic	88.89	90.89	.24	57	57	-.05	Y	-.09	-.04
3	Nonlinguistic	88.42	75.29	.16	15	20	.25	N	.51	.20
4	Note-taking	80.03	71.76	.02	41	40	.26	N	.53	.20
5	Nonlinguistic	85.51	85.11	.92	32	36	.03	N	.06	.02
6	Note-taking	13.13	12.13	.33	25	13	.16	N	.33	.13
7*	Nonlinguistic	87.91	87.45	.91	18	15	.03	N	.06	.02
8	Nonlinguistic	79.88	77.24	.41	27	22	.12	Y	.25	.10
9	Nonlinguistic	7.92	7.99	.87	61	36	-.03	Y	-.06	-.02
10	Nonlinguistic	7.66	4.80	.00	18	25	.42	N	.93	.32
11	Note-taking	67.32	70.27	.53	24	24	-.09	N	-.19	-.07

12	Nonlinguistic	86.87	73.68	.02	13	26	.39	N	.84	.30
13	Nonlinguistic	82.70	87.81	.24	21	19	-.19	N	-.39	-.15
14	Graphic Organizer	94.62	94.48	.95	20	22	.03	N	.06	.03
15	Comparison	76.56	78.35	.56	43	39	-.06	N	-.13	-.05
16	Comparison	9.58	8.17	.02	22	26	.34	N	.72	.27
17	Nonlinguistic	4.07	5.35	.21	25	21	-.19	Y	-.39	-.15
18*	Note-taking	12.98	12.03	.95	27	23	.03	N	.06	.02
19*	Note-taking	61.94	49.96	.00	17	24	.62	N	1.59	.44
20*	Nonlinguistic	25.13	24.53	.43	23	23	.12	N	.25	.10
21*	Kinesthetic	78.21	48.20	.19	4	3	.62	N	1.60	.44
22*	Nonlinguistic	19.05	19.50	.92	13	15	.03	N	.07	.03
23*	Historical Invest	65.09	73.80	.01	14	23	-.42	N	-.93	-.32
24*	Effort	5.41	5.93	.01	19	19	-.42	N	-.93	-.32
25	Nonlinguistic	81.79	77.96	.18	89	45	.12	N	.24	.10

Adjusted exp mean: the post-test mean of the experimental groups adjusted for differences in the pre-test scores.

Adjusted control mean: the post-test mean of the control group adjusted for differences in the pre-test scores.

Prob: the probability of observed differences between adjusted means under the assumption of no true differences between means (i.e. the null hypothesis)

Exp N: the number of students in the experimental group

Control N: The number of students in the control group

Corr: the Pearson Product Moment correlation representing the relationship between the use of instructional strategies and student achievement on the adjusted post-test scores

Ceiling: Y indicates that the study involved ceiling effects; N indicates that it did not

Effect size: the standardized mean difference between experimental and control groups

P Gain: the percentile gain or loss indicated by the effect size

*: the asterisk indicates that some outlier scores for students in the experimental and/or control classes were excluded

In a purely statistical sense the individual action research projects did not result in a great deal of significance between the post-test gains of the experimental groups and the control groups. Only seven of the individual action research projects exhibited statistical significance individually. For an individual study to be considered statistically significant, the value in the column Prob must be .05 or lower. This column measures the probability of the assumption that there would be no true differences between the adjusted means of the experimental group and the control group. The data from these individual action research projects does become statistically significant when meta-analytic techniques are used to consider the findings of the entire group. Combined the studies statistically are below the .05 significance factor in the column Prob indicating there is a significant difference between the experimental group and the control group. Figure 2 aggregates the data in a variety of ways that demonstrate statistical significance.

Figure 2: Summary Findings for All Studies

Data Set	% passing strategies not used	% passing strategies used
All included	50%	58%
Ceiling effects excluded	50%	60%
Ceiling effects & outliers excluded	50%	65%
Best case	50%	94%
Worst case	50%	18%

Note: Findings in all rows represent statistically significant results ($p < .05$)

To interpret Figure two, first look at the column entitled "% passing strategies not used." This column serves as a reference point for each of the rows in the figure and is always 50%. The column serves as a reference point and indicates that if a test was given and the instructional strategies were not implemented it would be expected that 50% of the students would pass the test and 50% of the students would fail. The column entitled "% passing strategies used" lists the % of students that would be expected to pass the same test if the instructional strategies were used. Row one entitled "all included" takes into consideration all of the 25 action research projects and indicates that based on the findings 58% of students would now be expected to pass the test. For the case study school an improvement of 8% in a school of approximately 1750 students would mean that 140 more students would be expected to pass the same test. The next column is entitled "Ceiling effects excluded." Ceiling effect occurs when many or even most of the students receive a perfect score on the posttest. Ceiling effect can mask the differences in the performance of experimental versus control students. The two groups of students can appear to have performed equally on the post-test when their respective understanding of the content could be

different. When the studies affected by ceiling effect are excluded the % of students increased to 60% or 175 students in the case study school.

Row three of the figure entitled "Ceiling effects and outliers excluded" again excludes the studies with ceiling effect but it also excludes outliers. Outliers are studies that are significantly higher or lower than the other studies in the group. When outliers are excluded typically a more uniform sense of the study is achieved. When the studies affected by ceiling effect and outlier studies are excluded the % expected to pass the test increases to 65% or 263 students in the case study school. The "Best case" and "Worst case" rows identify the studies with the highest and lowest passing rate or best and worst case scenarios.

The studies can also be interpreted by looking at the individual instructional strategies and the expected effect on % of students passing a comparison test. Figure 3 contains this data.

Figure 3: Findings for Specific Strategies

Strategy	% passing, strategies not used	% passing, strategies used
Nonlinguistic Representations (including graphic organizers & kinesthetic activities)	50%	60%
Note taking	50%	68%
Comparison	50%	62%
Historical Investigation	50%	18%
Effort	50%	18%

Note: Findings in all rows represent statistically significant results ($p < .05$)

The columns in Figure 3 can be interpreted the same as the columns in Figure 2. Row one of Figure 3

"Nonlinguistic Representations (including graphic organizers & kinesthetic activities) combines all of the studies using Nonlinguistic strategies, the expectation is that 60% of students would pass the test or 175 more students. Row two indicates that when note taking or summarizing strategies are implemented the % increases to 68% or 315 more students.

Following the sharing of this information with the participants in the project the teacher leadership group of the case study school was asked the following questions. The quantitative information resulting from the answers to the question is evidence that the case study school had the teacher "buy in" that the literature identifies as crucial to successful implementation of an initiative. The answers to the questions follow:

Question #1: Given the intent of this project, do you support its continuation?

Yes: 96% (N=24)

No: 4% (N=1)

Question #2: Is there enough faculty support to continue this project?

Yes: 88% (N=22)

No: 12% (N=3)

General comments:

- We should continue this provided that we have clear leadership and training.
- Yes, let's do it, but there will be some resistance
- Yes, there is support to do this. People want to become better, but we need strong incentives from the administration.
- Yes, but there will be some obstacles to overcome.
- I think many faculty members are skeptical, especially with such a big turnover in administration. This will live or die by the behavior of these leaders.
- Yes, eventually the enthusiasm and positive results will grab the others.
- We don't have the support to continue yet, but people can be lead to implement and believe.
- We need to educate those who are not on board. We need to lead by example.

- Yes, but more work needs to be done to convince the outliers.
- The support will be there if enough direction is given.

The decision was made to continue the project into year two.

Figure 4 is an example of the individual teacher data that resulted from the year two project.

Figure 4

TEACHER ID	GAIN	LEARN	ATTENTION	WORK HARD	IMPLEMENT STRATEGY
0614	60.03 (40) (25.02)	2.20 (40) (.76)	2.48 (40) (.55)	2.10 (40) (.71)	3.00
0658	26.67 (30) (20.57)	2.31 (29) (.54)	2.45 (29) (.63)	2.21 (29) (.77)	3.00
0724	54.31 (13) (20.77)	2.15 (13) (.69)	2.23 (13) (.73)	2.38 (13) (.77)	4.00
0891	32.74 (19)	2.00 (15)	2.40 (15)	2.27 (15)	3.00

	(26.07)	(.76)	(.51)	(.59)	
	11.69	2.00	1.92	1.92	
	(26)	(25)	(25)	(25)	
1020	(20.78)	(.87)	(.86)	(.91)	3.00
	27.86	2.32	2.50	2.68	
	(21)	(22)	(22)	(22)	
1074	(25.53)	(.57)	(.51)	(.57)	3.00
	39.19	2.15	2.22	2.41	
	(74)	(72)	(74)	(73)	
1123	(18.49)	(.82)	(.76)	(.76)	2.00
	13.96	2.63	2.21	2.46	
	(52)	(48)	(48)	(48)	
1217	(11.91)	(4.27)	(.54)	(.54)	4.00
	67.09	2.21	2.29	2.38	
	(68)	(58)	(58)	(58)	
1225	(22.69)	(.67)	(.65)	(.56)	3.00
	31.43	2.16	2.53	2.68	
	(21)	(19)	(19)	(19)	
1226	(21.28)	(.60)	(.51)	(.48)	4.00
	25.25	2.33	2.35	2.30	
	(40)	(40)	(40)	(40)	
1517	(22.87)	(.62)	(.58)	(.65)	4.00

	46.40 (100) (17.03)	2.39 (99) (.67)	2.36 (99) (.60)	2.36 (99) (.65)	4.00
1759					
	19.41 (42) (19.39)	2.63 (43) (.58)	2.60 (42) (.59)	2.65 (43) (.48)	3.38
1962					
	29.60 (25) (26.53)	2.56 (25) (.65)	2.24 (25) (.78)	2.60 (25) (.65)	4.00
1978					
	17.22 (49) (24.93)	2.33 (39) (.62)	2.23 (39) (.58)	2.26 (39) (.64)	3.00
1989					
SCHOOL	36.41 (35.45)	2.26 (33.82)	2.35 (33.84)	2.39 (33.82)	
AVERAGE	(17.98)	(.73)	(.65)	(.64)	

Figure 4 presents profile information for each teacher. Specifically, column 1 of Figure 4 identifies each teacher's identification code. Column 2, entitled "gain" reports the average difference score between the posttest and the pretest. This might be interpreted as the average gain in learning of students in each class. The first number in parenthesis in this cell is the number of students for whom posttest and pretest scores were available. The second number in parenthesis in the cell reports the standard deviation of the gain scores for students in the class. This is a measure of "differences" between students in the class. The greater this number, the more students' gain scores differed in the class. A frame of reference for interpreting these quantities is provided at the bottom of the Figure 4 in the row entitled "school averages." For example, a gain score above the school average indicates that for a particular teacher the average gain score for students was higher than that typical for the school. A number in the first parenthesis larger than that in the cell for school averages indicates that for a particular teacher the number of students for whom gain scores were computed was larger than that typical for the school. A number in the second parenthesis larger than that in the cell for school averages indicates the standard deviation (or differences) of gain scores for a particular teacher was greater than that typical for the school.

The column entitled "learn" reports the average score for students' ratings of how much they learned in class. The column entitled "attention" reports the average score for students' ratings of how much they paid attention in class. The column entitled "work hard" reports the average score for students' ratings of how hard they worked. Again the numbers in the first and second parentheses represents the number of students and the standard deviations respectively. Again, the row entitled "school averages" provides comparative data for these quantities. Finally, the column entitled "implement strategy" reports each teacher's rating of their use of a particular instructional strategy.

Figure 5 is an example of a graph that was generated from the data and distributed to teachers. Similar graphs were created and distributed for Learn, Attention and Work Hard scores. The X-axis is a representation for Teacher ID for example the teacher with Teacher ID 0030 was assigned number 1 for this graph. Each Teacher ID was assigned a number from 1 to 76. The Y-axis is the gain score. The dark horizontal line at 36.41 represents the school average for Gain Scores.

Figure 5

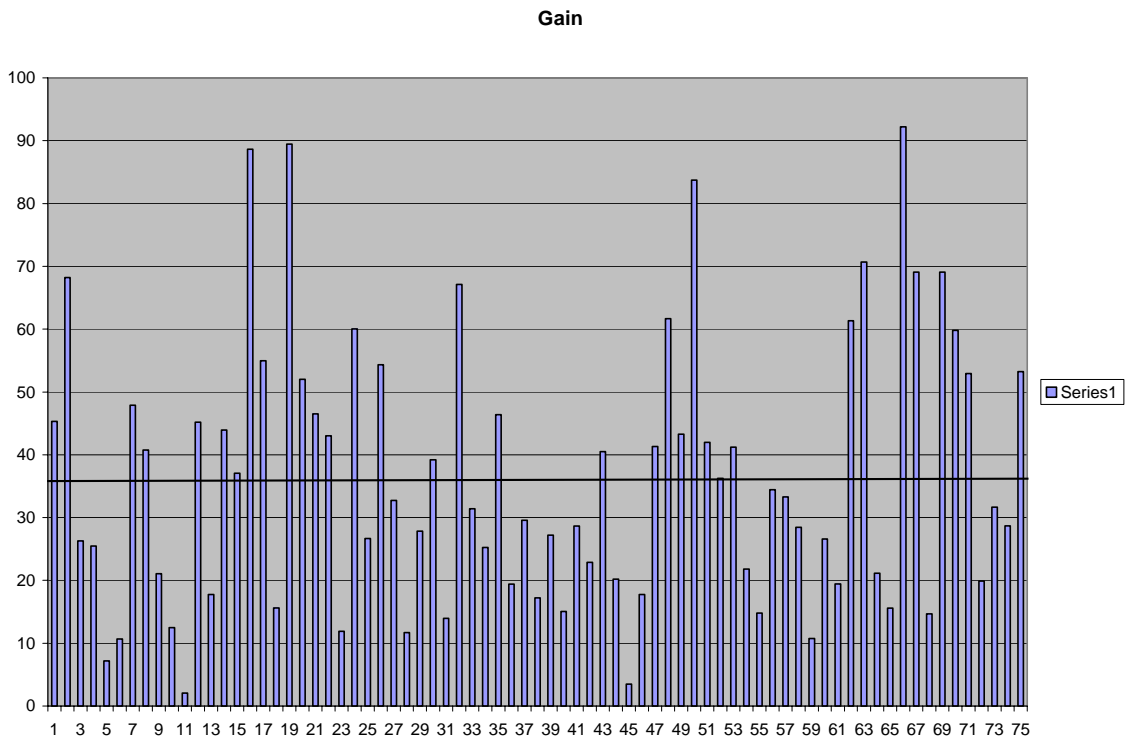


Figure 6 organizes the information for the four measured student areas based on how teachers evaluated themselves on use of the strategy.

Figure 6

Figure 6: Means by Strategy Use

Strategy Use	Gain	Learn	Attention	Work Hard
2 (N=1)	39.19 (N=1)	2.15 (N=1)	2.22 (N=1)	2.41 (N=1)
3 (N=38)	35.04 (N=38)	2.18 (N=38)	2.32 (N=38)	2.34 (N=38)
4 (N=34)	38.38 (N=34)	2.34 (N=33)	2.38 (N=33)	2.44 (N=33)

Figure 6 compares teacher perceived effectiveness (Column 1) with the average gain score (Column 2) and student perceptions of degree to which they learned (Column 3), paid attention (Column 4) and how hard they worked (Column 5). The scores for Columns 2 through 5 can be compared to the school averages found at the bottom of Figure 4. For example Row 1 shows that one teacher (N=1) rated their use of the strategy as a 2 which indicates they did not feel very strong in the implementation of the strategy. The gain for the students for the teacher in this category was 39.19 which is better than the average gain of 36.41 for the entire project. Learn, Attention and Work Hard averages can be compared in the same manner to the project averages found at the bottom of Figure 4.

The culmination of the three-year action research project was the generation of an instructional manual featuring the lessons and stories of the teachers participating in the project. The manual was revised yearly following the initial three years.

The data from the project indicates quantitatively that the strategies tested increased student achievement. Dr. Marzano often begins discussion of data with thoughts credited to mathematical statistician George Box, all mathematical models are false but some are useful. Marzano (2007) expands on the thoughts of Box, "In effect, Box warned that mathematical models that form the basis of all quantitative research are approximations only of reality, yet they can help us understand the underlying dynamic of a specific situation."(p.4)

Specific to the case study school the usefulness of the data was magnified by the discussions among the school community of the data. Some of the most meaningful discussions came from teachers who did not experience the same gains as other teachers and in some instances had a negative effect. These teachers reflected critically on their own practices and made adjustments or sought information from those teachers who had experienced increases and refined their use of the strategy with the

help of their peers. This type of reflection and the effect it had on teacher's future actions fits the definition of action research given by Sagor (2003). Marzano (2003) suggested that trying out a strategy in their own class and measuring the impact of the strategy may be the most effective application process a teacher can do.

The data collected by the case study school during the action research project demonstrated that increased student achievement was possible if research proven instructional strategies were increasingly implemented. Administrators in the case study school shared the same frustration with administrators from similar surrounding schools regarding student failure rates. The data from the action research of the case study school approximated that 140 to 263 more students might be expected to pass a test if the instructional strategies were implemented. The number increases or decreases if you look at the data based on individual strategies.

In the event that the estimated 140 to 263 students did in reality increase their achievement that still would not reach the goal of the case study school if a direct correlation could be drawn between the actual data from the action research project and the actual failure rate of students in the school. The improvement in the schools

failure rate would however be measurable movement in the right direction to a number that had been stagnate for years. The challenge would be to continue to refine practices related to what was learned during this action research project but to also design other action research projects to evaluate other classroom practices or strategies. Overtime this type of critical and measurable reflection on all aspects of teaching combined could result in the significant improvement desired.

Collins (2001) observations of the good to great companies led to this type of critical reflection by the members of an organization that can lead to a significant breakthrough "rinsing your cottage cheese." The analogy is to Dave Scott a multi time Ironman Triathlon winner who was so attentive to the details of all aspects of his program that he would rinse his cottage cheese with water to minimize his fat intake even though he burned over 5,000 calories a day. Looking at the good to great companies the attentions to all of these details did not lead to immediate success but this disciplined approach built up over time to a breakthrough when all of the small improvements combined. Think "flywheel." (Collins, 2001)

The second research question dealt with what effects the action research data had on school improvement and

teacher ownership. Teachers participating in the first year action research project submitted their pre-test and post-test data to an administrator in the school in a confidential manner. The administrator shares anecdotes of the conversations that often took place when the data was submitted and indicates that they are highlights of his career. Teachers with a reputation for being highly effective teachers shared stories of their results with great enthusiasm and discussed how they were going back immediately to adjust current lesson plans to re-teach the students who had not been taught with the strategy and adjust future lesson plan to implement the strategies throughout.

Time was taken at each faculty meeting for a staff member to share the results of the project. A teacher who implemented a non-linguistic strategy in a self-contained special education social studies class shared one particularly powerful story. The teacher was cautious when beginning the project but the emotion that was evident when she addressed the staff with her story was an enormous push on the "Flywheel." She shared the historically low performance of these students on assessments compared to all of the students getting at least a B on the posttest of her project. She shared stories of these students talking

with pride about their accomplishment throughout the day. The final piece of this story was one of the most powerful. Months after the action research project the case study school was putting together a video presentation and wanted pictures of the student's samples. The students had all taken them home so the teacher asked if they could recall the information in class and they were very successful at recalling the information.

Reeves (2004) indicated that there are three tiers of data that should be utilized for schools to be most successful but often schools only utilize the 1st Tier which is basically student assessment data. The case study school gathered Tier 2, measurable indicators of professional practices, through the data collected by the action research project. Tier 3 data, the stories behind the number, was accomplished through the collaboration that followed, the stories at faculty meetings and ultimately the creation of a faculty handbook that is updated and referred to yearly. The initial frustration of collecting the data but the ultimate collective buy in experienced by the teachers at Tess Corners was experienced by many teachers in the case study school. (Conzemius et al., 2001)

The impact of the action research data on teacher ownership was significant (based on anecdotes of

discussions that occurred before during and after the action research project) and the principle of teachers in a PLC not being content with external validation became more evident in the case study school. Teachers in the case study would be more skeptical until they could internally validate a practice with their students. (Eaker et al., 2002) There is a danger if teachers use this as an argument to dismiss a practice saying it won't work in their class without going through a valid research project.

The duality of thought that an organization must have an unwavering dedication to a vision and at the same time understand the brutal facts of the moment characterized by Collin's "Stockdale Paradox" came into play for the case study school. (Collins, 2001) Student achievement data identified a need to reflect critically on what was happening in the school and the action research data initiated some of the hard discussions that must occur for positive change to begin.

The teacher leadership group played a crucial role in the action research in response to the third research question: What role did the teacher leadership group play in the action research? The literature was consistent, in order for a reform project to be successful the responsibility and leadership must be shared. Collin's

concept of "first who...then what" characterizes the involvement of the leadership group of the case study school well. (Collins, 2001) The right people were in place prior to beginning the action research project. The teacher leadership group looked at student achievement data and described concerns within their own classroom and decided that something must be done.

The leadership group met with Dr. Marzano and worked in conjunction with him to design the action research project. The teachers were very active in the development of the plan and realized the challenges of trying to undertake a project of this nature with a staff of over 100. The teachers in the leadership group were the first to be "infected" and to begin applying force to the "flywheel." They took risks by being the first to stand up in front of their colleagues and share their stories. Some had to share the brutal facts that their action research project actually had a negative effect on student achievement but followed up sharing the reflection they engaged in following the project that improved their instruction. Teachers in this group were motivated by their data to stay after hours and hold mini workshops to help other teachers integrate the strategies into their lessons and design their projects, "infecting" them with

the excitement and enlisting their help to push on the "flywheel."

Teachers from the leadership group worked extra hours to create the instructional handbook and updated it yearly. Teachers from the group designed professional development workshops for teachers new to the building and teachers who were working with groups of students continuing to struggle academically. Building administration changed significantly during the project, the consistency provided by the leadership group was crucial to any success that resulted from the project.

The fourth research question for this study was: What role did administrative leadership play in the action research. The importance of the teacher leadership group was described above and reflected what the research indicated is necessary for a school reform project to be successful. The research also indicated the importance of those in positional leadership roles in successful implementation. The review of literature identified the characteristics of this type of leader. The case study schools project was successful because of the teacher leadership group but also because of positional leaders. The Board of Education approved additional late starts so teachers would have time to collaborate. Central Office

administrators encouraged the case study school to think big and allocated funds to support the initiative. Central Office administrators worked in conjunction with the Board of Education to allocate the additional time. Initial building level administration got the right people "on the bus" and stimulated the development of the vision of the project. New building level administration worked in conjunction with the leadership group to understand the project and then gave a big push on the "flywheel" by continuing the project with a "hedgehog" mentality.

The perceptions of deteriorating culture, communication, order and input described by Marzano, Waters and McNulty (2005) were real for the case study school during the project. (Marzano et al., 2005) The case study school was successful with the project partly because they embraced confronting these perceptions head on. One anecdote from an administrator involved with the project is an example. The administrator was walking by a classroom during a late start and the group of teachers was working on developing their project. The administrator heard someone in the group say, "there he is" the comment was not perceived by the administrator as an endearing comment but rather one of he is the root of my frustration at this time. The administrator chose to not ignore the comment

but instead return to the room and engage in the conversation. Initially the conversation was a little hard but once a few stumbling blocks were addressed very productive conversation resulted and the teachers quickly developed a plan for their project.

The fifth research question: What role did the action research play in teacher evaluation was a source of a lot of discussion during the development of the project and throughout the project. Teachers were encouraged from the beginning to take risks and try new strategies with their students and assured that poor performance by students in the action research project would not be a part of their evaluation. When designing the action research project care was given to insure anonymity of the data when it was shared with staff, this did not end up being as important to staff and hindered some discussion.

The approach the teachers of the case study school took with this project reflected Reeves claims that, "If teachers systematically examine their professional practices and their impact on student achievement, the results of such reflective analysis will finally transform educational accountability from a destructive and unedifying mess to a constructive and transformative force in education." (Reeves, 2004, pp. 5-6) This type of

accountability is not part of the traditional teacher evaluation process but has the potential to be the most effective at reaching the goals of traditional evaluation processes.

Following the action research projects and the collection of the data, there became an expectation of administrators to see utilization of the instructional strategies when doing teacher observations. If use of the strategies were not observed administrators would ask the teachers when they could come and observe a lesson that utilized the strategies. In the event that the teacher was not utilizing the strategies the administrator would facilitate a meeting with another teacher considered an "in house" expert to develop a lesson.

Following the action research project another example of Central Office Administration leadership was the development of a new teacher evaluation tool that emphasized the strategies. The formative assessment form that building level administrators would complete when observing teachers in the district listed the research based instructional strategies and was designed so that the amount of time and the degree of engagement could be documented.

Ceiling effect has been described earlier in the paper and the effect that it had on the data from the project has been addressed. The sixth research question was: How can ceiling effect become less of a factor in future action research projects. The impact of ceiling effect on the original action research is not as important as the discussion of why it occurred. Lessons learned are going to be a significant part of the discussion in Chpt. 5 and the discussion relative to ceiling effect and reducing its effects in future projects will be addressed there.

CHAPTER 5

DISSCUSION

Professional Learning Communities (PLC's) operated under the belief that the knowledge existed within the staff of schools to improve the performance of the particular school if the staff members were provided the opportunity and the appropriate structure to have meaningful collaboration regarding the schools practices. The foundation for the structure of the collaboration was the three essential questions regarding student learning.

The purpose of this study was to analyze the data generated by a case study school's action research project. The school was maturing as a PLC and had identified the need to improve instructional strategies to increase student achievement. The action research project of the case study provided quantitative data to analyze. The actions of the staff before, during and after the action research project provided qualitative data that were compared to the research related to high quality professional development and school improvement. The book *Good to Great* was included in the review of literature to provide a comparison of practices that were believed to

lead to school improvement to those that had led to documented improvement in the business world.

Methodology

Quantitative data was generated through an experimental design that included experimental and control classes that were given identical pre-tests and post-tests over the same learning goals. The only independent variable in the design was the instructional strategy utilized. The dependent variable was the difference in post-test gains between the experimental and control groups. The continuation of the study included a review of literature focused on successful school improvement initiatives. The findings in the literature were compared to qualitative data from the action research project (anecdotal data from staff involved in the action research) for the second part of the study. The research question guiding the study were:

1. What did the action research project data indicate regarding the effectiveness of the instructional strategies?
2. What effect did the action research data have on school improvement and teacher ownership?
3. What role did the teacher leadership group play in the action research?

4. What role did administrative leadership play in the action research?
5. What role did the action research project play in teacher evaluation?
6. How can ceiling effect become less of a factor in future action research projects?

Questions one and six are most related to the quantitative data that resulted from the action research. Question one is clearly the student achievement data that resulted from the action research. Question six was necessary to the study for a few reasons. Ceiling effect had a limiting effect on the data discussed in question one and is a critical component to the discussion of further studies of this nature. Questions two through five were most directly related to the comparison of the qualitative data to the review of literature.

CONCLUSIONS

The quantitative data collected during the action research of the case study school indicated that utilization of the tested instructional strategies increased student achievement. The data is presented in detail in chapter four. For the case study school the information from the action research indicated that 140 to 263 more students could be expected to pass a test that they would not normally pass if the tested instructional

strategies were not utilized. The data generated by the action research project indicates that schools looking to improve student achievement should utilize the tested instructional strategies in their classrooms.

The qualitative data and review of literature that are the second part of the study indicated that those schools looking to improve student achievement should do more than just look at the quantitative data from the case study school and decide to implement the strategies. The qualitative data and the review of literature both indicated that the conversations or collaboration that generated from the case study schools action research were as important as the data the action research generated. The quantitative data was only part of the story and this is directly in line with the accountability system that Reeves champions for significant school improvement and teacher accountability. The quantitative data from the action research would be the synthesis portion of his model but to be effective the system should also include observation, reflection and replication. The practices that took place as the case study school planned, implemented and continued the action research addresses all four prongs of Reeves model. There were similarities

throughout the literature to Reeves model throughout the literature including several of Collins good to great philosophies.

Lessons Learned

Schools looking to participate in an action research project similar to the case study school will want to give careful consideration to how important teacher anonymity is when distributing data and how it will be dealt with. The case study school was very careful to protect the anonymity and this made it more difficult for teachers to look at the data. For example a teacher that tried a non linguistic strategy and was not as successful as they had hoped would look at the data and see that another teacher had utilized a similar strategy with success but could not identify who the teacher was to initiate a conversation easily.

The case study school held follow up meetings for individual strategies on a professional development day following the project to facilitate some of these conversations but was not as timely as preferred. Case study teachers indicated following the project that they were not as concerned about remaining anonymous if it would facilitate better collaboration. Schools attempting this type of project should give careful consideration to how

data will be handled so that teachers are willing to take a risk and try something new in their class and at the same time be able to easily discuss the results building wide.

Another lesson learned was ceiling effect. The primary reason the case study school had so many studies limited by the ceiling effect was the design of the pre and posttests. The case study school attempted to make submitting the projects as teacher friendly as possible and this resulted in the pretest and posttest questions primarily testing at the knowledge level. Had the assessments tested a better combination of knowledge level and higher levels thinking skills there may not have been as many students scoring a perfect score on the posttest thus limiting ceiling effect.

The major benefit of improved assessments, in future action research projects, that test higher level thinking skills and limit ceiling effect will not be the improved data from the study but more importantly the resulting instruction of higher order thinking and greater student achievement. The improved data could provide an even more measurable case to utilize the instructional strategies but the greater student achievement was the goal in the first place. Teaching will have improved when teachers, "know

that students this year have received more frequent feedback than was the case last year, and they know that students have been challenged to think, analyze, reason and write more frequently than last semester." (Reeves, 2004, p.51)

Recommendations

Continuation of this study should include designing pre test and post tests that assess a students understanding of higher order thinking skills. Ceiling effect would be less of a factor on future research projects if assessments are designed in this manner.

The goal of the project was to institutionalize instructional strategies. Follow up studies designed to determine if this goal was met should analyze the PBTE documents of the case study school. The case study school's PBTE documents were redesigned, following the action research project, to identify the utilization of the strategies. An analysis of these documents would provide a quantitative measure of the utilization of the strategies in the case study school.

Analysis of student achievement data such as state assessments, ACT scores and AP exam scores would be another follow up study with the case study school that would be

valuable. There is logic in expecting improvement in these scores in the case study school if there is measurable increase in the utilization of the instructional strategies.

Continuation of this study could also focus on the development of the instructional strategies manual produced by the case study school and its continued use as a professional development tool by the case study school. The manual fits the description of 3rd tier data identified as important by Douglas Reeves. Continued utilization of the manual could be quantified by evaluating each version of the manual created yearly for number of updates. Another measurement could be gathering artifacts from the case study school that would provide evidence of utilization of the manual in training staff new to the school and reminding current staff of the need to utilize the strategies proven effective during the action research.

The action research project completed by the case study school was a result of the right people choosing the right work. Participation in the project led to the case study school experiencing high quality professional development that encompassed best practices identified by researchers of that time.

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