THE IMPACT OF IMPROPER IMPLEMENTATION OF PROCESS IMPROVEMENTS BY CERTIFIED SIX-SIGMA EXPERTS

A Doctoral Dissertation Research

Submitted to the
Faculty of Argosy University, Chicago Campus
College of Business

In Partial Fulfillment of
the Requirements for the Degree of

Doctor of Business Administration

By:

William R. Downes

March 2013

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Dissertation Committee Approval

Deborah Shearer, PhD
Digitally signed by Deborah Shearer, PhD
DN: cn=Deborah Shearer, PhD, o=Argosy University Online, ou=College of Business, email=dshearer@argosy.edu, c=US
Date: 2013.06.20 12:12:48 -04'00'

Dr. Deborah Shearer: Dissertation Chair

Date

Boris Djokic
Digitally signed by Boris Djokic
DN: cn=Boris Djokic, o=Argosy Online, ou=Business, email=bdjokic@argosy.edu, c=US
Date: 2013.04.24 20:32:38 -04'00'

Dr. Borivoje Djoki: Committee Member

Kate Noone, EdD
Digitally signed by Kate Noone, EdD
DN: cn=Kate Noone, EdD, o=Argosy University, ou=College of Business, email=knoone@argosy.edu, c=US
Date: 2013.06.19 20:56:06 -04'00'

Kathleen Noone EdD Program Chair

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Dr. Deborah Shearer

Dr. Borivoje Djoki

Department: College of Business

ABSTRACT

Process improvement is used worldwide in many platforms of organizations. The process of improving operating and business processes are led by Black-Belts and Green-Belts using the Six-Sigma methodology (Harry & Schroeder, 2000). The goal of Six-Sigma tool usage is to eliminate waste, improve efficiency, and increase profit. Leadership styles have been a factor in this process with positive and negative effects. The research of organizations using this methodology shows the impact leaders have on subordinates and the success of projects on lean manufacturing for business or operations. The key factor of positive or negative outcomes is shown through quantitative and qualitative mixed method reviews of content analysis of articles and phone interviews of current Black and Green Belts delivering the benefits of Six-Sigma leading projects supported by upper level company management. The data supports statistical analysis that shows which key leadership styles will benefit leadership in companies using the tools of Six-Sigma.

ACKNOWLEDGEMENTS

To God, who sustained me during this process and gave me the strength to keep going. “I can do all things through Christ who strengthens me.”

To my wife Dr. Loureen Downes for her dedication and support not letting me give up, and to my children, Michael and Matthew, who bring such happiness and energy, I hope you have been inspired to persevere to the end. To my Father Pastor William Garvy Downes and Mother Esther Elise Downes (deceased), sisters Sherrel and Heather, in-laws, extended family, and friends, thank you for your love and support to believe in me.

To Dr. Deborah Shearer, my major advisor and a true coach through the process, Deborah has truly been an inspiration to me with her positive reassuring demeanor, patience and keen eye for details.

To my committee member and reader, Dr. Borivoje Djoki (Dr. Boris) for meeting me in person for expert statistical guidance and support; The group of doctoral faculty members at the Argosy School of Business from 2007 to 2011 who shared their expertise and encouraged each student to be the best that they could be; The Six-Sigma co-workers from aerospace companies;

To my colleagues, who were so brilliant and shared much of themselves and for your encouragement and support; To Argosy University for providing a learning institution with the academic accommodations for doctoral studies in Business.

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CHAPTER ONE: INTRODUCTION

Overview of the Study

Six-sigma Black-Belts currently implementing continuous improvement in business or operations lack leadership and management styles. Black-Belts exhibiting weak influence on subordinate personnel lead poor implementation of the Six-Sigma practices. The practices are referred to as process improvement (PI) and continuous improvement (CI). Black-Belts are full-time change agents that lead the continuous improvement project to solve product and process defects while lowering financial cost using the methodology of Six-Sigma (Harry & Schroeder, 2000). Literature over the past 30 years has noted the importance of leadership supporting change and the positive results in change led efficiency (Deetz, Tracy, & Simpson, 2000). Black-Belts lead this change by facilitating the change process to drive efficiency in organizations (Eckes, 2001a).

Continuous improvement is inevitable in company job occupations and process improvement projects that measure and address specified Six-Sigma models. Some companies participating in PI are Pratt & Whitney, Otis Elevator, Motorola, and others. The Six-Sigma model gives tools for businesses in effectiveness and efficiency (Rath & Strong, 2003). Continuous improvement with strong leadership documented in literature argues guidance to change processes and increased probability of success (Deetz, Tracy, & Simpson, 2000). Six-Sigma is successful building the leader's capabilities and identifying leadership. Good leaders are effective at influencing colleagues, superiors, and subordinates (Yukl & Tracey, 1992).

Problem Statement

For the last couple of decades, literature has documented leadership style influence in facilitating continuous improvement and increasing the probability of success (Deetz, Tracy, & Simpson, 2000; Eckes, 2001; Harry, 1998 et al.) Six-Sigma identifies leadership styles providing direction and a mechanism to influence subordinates as they implement continuous improvement in an organization (Yukl & Tracey, 1992). Companies with traditional business models missing the Six-Sigma system may consider business practices supporting lean manufacturing that will solve any normal to severe problem promoting waste and inefficiency.

Right now the Six-Sigma model directs work with quality experts who plan and implement product and process improvements. Business organizations may possess the leadership styles that influence subordinate personnel for proper implementation of the Six-Sigma practices. Leadership styles effect process improvement resulting in company profits (De, et al., 2004). Mikel Harry, one of the original architects of Six-Sigma working at Motorola, developed the Six-Sigma methodology in the late 1980s to solve difficult business problems. The methodology involves operation research to prevent problems from re-occurring in manufacturing environments. Black-Belts are contributors from an organization serving as change agents, consultants, and Six-Sigma tool mentors (Rath & Strong, 2003).

This research reviews leadership influence styles and the impact on implementing Six-Sigma tools in production or business environments. Research on sources of managerial strength reflects the types of influence managers use objectively (Kipnis & Schmidt, 1988). The problem solution based in this research may provide an

implementation model promoting leadership style and change leadership. Once we understand leadership influence on continuous improvement, the answer to the problem impacting leadership styles is identified.

Without an effective leadership style influence at different levels within an organization, quality and operations experts, referred to as Black-Belts in Six-Sigma processes and methods, will have less influence to implement effective use of Six-Sigma tools. Rath and Strong (2003) imply that Black-Expert experts may not possess the leadership style that subordinates need for proper implementation of Six-Sigma practices. Bass (1985) argued that leaders reach goals by motivating, guiding, and coaching subordinates. Implementing change programs using Six-Sigma in organizations is dependent on the leaders' influence behavior. Six-Sigma is perceived as a statistical quality improvement program disregarding the human element related to a change program. The focus of research in this area has centered on Six-Sigma as a leadership skill (Rath & Strong, 2003), and proper leadership training will support positive influence on subordinates.

Literature

The body of knowledge identifies change models including General Electric's (GE) process model with seven step acceleration (Garvin, 2000), the eight step model for growing organizations (Kotter, 1995), and the ten step tactical model for implementing change (Jick, 1991). (Appendix A).

General Electric (GE), Texas Instruments (TI), and Honeywell implement Six-Sigma methods currently in their business model. The healthcare industry, Home Depot and other retail companies are using the Six-Sigma tools (Berger, 2003; Harry &

Schroeder, 2000). Technology companies use Six-Sigma as a change process for efficient internal processes, and customer satisfaction. Six-Sigma is defined statistically measuring the quality of processes in manufacturing, production, operations, and so forth, reflecting optimal perfection. The defect rate is 3.4 per million (Eckes, 2001). Six-Sigma allows manufacturing companies to compare processes, products, and services not related. Products are measured to 66,807 defects per million allowing quality to improve while minimizing costs (Harry & Schroeder, 2000).

The philosophy and business strategy for organizations should position them to lead competitively in the business market. The improved Six-Sigma rating can improve quality and drive cost down. One goal of the organization is to decrease the number of errors and process variation in daily standard work. Six-Sigma reduces mistakes in manufacturing and promotes customer desired results (Harry & Schroeder, 2000).

Leadership

Leadership is the subject of continuous improvement discussions going back to the early 1900s. It is part of organizational cultures having a strong influence in decision making and planning (Hughes, Ginnet, & Curphy, 1999). Leadership invokes emotional intelligence and the discussion with variable influence factors is an endless subject (Goleman, 1998). Leadership and influence topics are based on the transformational leadership devised by Bass (Bass 1996). The focus is on the leader's influence on followers and behavioral change that leads to transformation. Loyalty and trust drives the followers to exceed expectations demonstrating trust and respect for the leader. The self-interest of the follower is motivated to perform with heightened awareness of task

outcomes (Bass, 1985). Transactional leadership promotes the follower to practice compliance following organizational rules and requests (Bass, 1996).

Research has reviewed leadership behaviors that influence followers and power manipulating influence tactics with limited control. Several influential tactics are identified with managers: pressure, consultation, inspiration, persuasion, and exchanges (Yukl & Tracey, 1992). Influential tactics of the leader's social power, task objective, influence predictors, and motivation was researched. The Six-Sigma change program missed comparison with the leadership effect on influence styles (Barbuto & Scholl, 1999).

Purpose

The purpose of this research study is to determine the effect of influence styles from Black-Belts and Leaders in an organization using Six-Sigma implementation tools. The quantitative and qualitative mixed method research examined influence tactics correlating the results with Content analysis. The dependent variables are defined as projects completed and cost saved overtime. The independent variables: (a) pressure, (b) consultation, (c) persuasion, (d) inspiration, and (e) exchange was developed from the Gary Yukl and Cecilia Falbe study (1990) and Hinkin & Schriesheim, 1990; Yukl & Racy, 1992; Yukl et al., 1992. The research data will be analyzed for preferred influence styles of transformational leadership in production industries.

Significance of the Study

Production companies can transform low performing organizations into high efficient production companies. Ten percent of companies are implementing the Six-Sigma program to increase profits and reduce waste from ineffective production causing

cost of poor quality (Coronado & Antony, 2002). Car manufacturers, building material suppliers, and aerospace manufacturers are companies adopting Six-Sigma tools (Berger, 2003). Today's implementation of change models succeed between 45% and 75% in businesses (Grant, McFaul, Pack, & Douglas, 2002). Change models are compared to Six-Sigma and the important differences can reflect the efficiency desired by a company. Leadership is a key part of implementation and success, and the study focused on how it interacts with production methods producing a return on investment. The content analysis exposed deficient organizational results allowing continuous improvement (Yukl & Falbe, 1990).

Nature of the Study

The study used quantitative and qualitative content analysis of literature reviews combining data from separate studies exploring five independent variables on leadership style influence in process improvement. The variables are pressure, consultation, persuasion, inspiration, and exchange developed by Yukl and Falbe (1990) for a self-assessment instrument. Process improvement with Six-Sigma was collected from peer reviewed journal articles. Cost savings from the projects managed by Black-Belts were compared on the implementation process of the projects influenced by leadership styles. The content analysis correlates the relationship of five independent influence styles variables with Six-Sigma process improvement change. The theoretical meaning of concepts and words were analyzed on messages within the text. Researched data referred to leadership historical data from journals, articles, interviews, and scientific research. The data was collected in a database for retrieval with standard input. Content analysis

was used to determine leadership style influences from dependent and independent variables. Statistics was used for analyzing data from coding themes.

Hypothesis

The question of study examines how Six-Sigma process improvement is affected by various leadership styles. The first hypothesis showed leadership styles compared with each other's influence styles in process improvement. Pressure, consultation, persuasion, inspiration, and exchange are the different leadership influence styles which frequency use is measured between Black-Belts and management.

Ho – There is no difference in management style when implementing process improvement

Ha – There is a difference in management styles when implementing process improvement

H1o – There is no difference in project completion and success between management styles

H1a – There is a difference in project completion between management styles

The second hypothesis is the leaders' success implementing process improvement with specific influence styles. The Six-Sigma projects would have a higher ratio of completion and success with cost savings. The dependent variable is the success of process improvement and cost reduction. The independent variables are pressure, consultation, persuasion, inspiration, and exchange by Yukl and Falbe (1990). The content analysis aimed to investigate the preferred influence styles of leaders implementing Six-Sigma, and which style has more influence on the success of process improvement using the Six-Sigma tools.

Framework

Persuasion uses logical arguments and information based on facts to persuade the audience on a proposal or project. The hypothesis comes from Yulkl and Tracey (1992), suggesting that persuasion works in an upward direction. Black-Belts use the tools of Six-Sigma with metrics influencing management. Objective evidence from the Six-Sigma tools steer management with various backgrounds and ranking to support a project. The leadership styles can be used in any direction supported by logic and facts. The behavior of Black-Belts and the theoretical work of Yulk and colleagues create the conceptual framework verifying this study's hypothesis.

The conceptual framework of the research method was a qualitative and quantitative mixed methods correlation study validating the hypotheses. The content analysis explored Black-Belts and managers employed in small to large company environments. The leaders' Black-Belt support, projects, management styles, and employee support of Black-Belts data were themes used in coding the data. Five independent variables on influence styles were assessed. Data on the dependent variables (Six-Sigma implementation success) were assessed from the content analysis focused on leadership support. This research is a non-experimental design using secondary data, or a cause of effect (Cresswell, 2003). The pre-existing condition used a quantitative, non-experimental descriptive correlation study identifying core characteristics. The statistical investigation observed the relationship between two or more variables excluding casual reasons underlying the variable (Leedy & Ormrod, 2001).

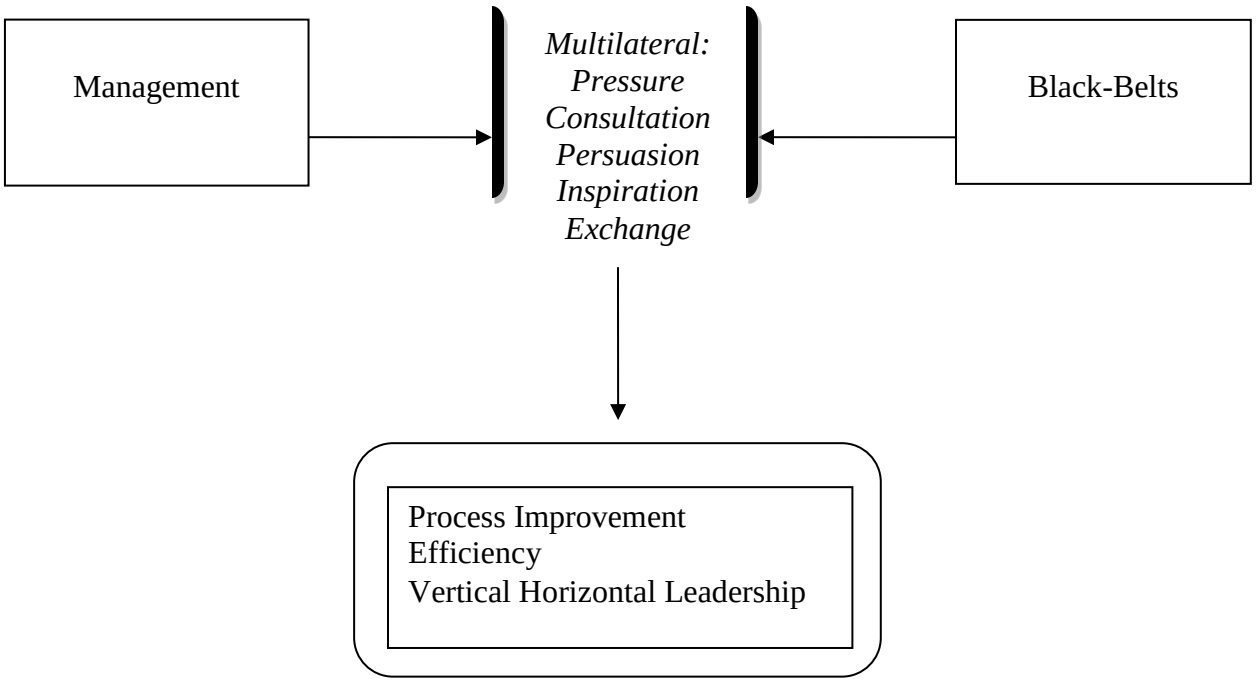

Figure 1. Conceptual Framework.

The conceptual frame work looks at the different levels of management from top to bottom. The company employees are categorized with lower level manager's subordination to senior managers and their individual staff subordination. The Black Belts leading the Six-Sigma process are related to the independent variables that influence their leadership styles for positive use of the Six-Sigma tools. The multi-lateral approach will review the styles used most having the biggest impact for positive results in cost savings.

Definition of Terms

Analysis - Dependent and independent variables are evaluated and reduced with graphical analysis, and hypothesis testing is performed identifying process improvement factors.

Black/Green Belt - Team leaders trained to guide staff in a business operation project with continuous improvement supporting lean manufacturing with profitable financial returns (Harry & Schroeder, 2002).

Consultation To engage a strategy with an individual influencing their strategy to change based on your ideas (Yukl & Tracy, 1992).

Control - Control is determined and process control is implemented in monitored projects keeping them on course.

Coalition - Soliciting other individuals to form unified support (Yukl & Tracy, 1992).

Define - Internal and external customer deliverables are explained in detail.

DFSS - Design For Six-Sigma to Define, Measure, and Analyze for product development (Rath & Strong, 2003).

DMADV - Define, Measure, Analyze, Design, and Verify – Six-Sigma five phase design (Rath & Strong, 2003).

DMAIC - Define, Measure, Analyze, Improve, and Control - Six-Sigma five phase project design (Rath & Strong, 2003).

Improve - Create solutions to prevent problems with a development plan.

Influence - One party using the collaborative approach to control another party (Yukl, 1989).

Management - Upper managements support of projects using Six-Sigma (Brue, 2002).

Measure - Process mapping is used to identify products and services base line measurement systems.

Pressure - The individual uses reminders, demands, and threats to gain their interest or need from you (Yukl & Tracy, 1992).

Process Owner - Management responsible for process after the Black-Belt is finished.

Quality Analyst - Verifies and validates the financial benefits cost saving in Six-Sigma tool usage.

Rational persuasion – Having control through real evidence where control over outcomes is not required (Yukl, 1989).

Six-Sigma - Process measurement with a near perfect 3.4 defects per million possibilities. Building and sustain business performance with leadership is characterized in the Six-Sigma System (Eckes, 2001)

SPC - Statistical Process Control, data collection and analysis of projects for capability and variability (Eckes, 2001).

Upward Appeal - Individuals using upper management approval to influence other individuals cooperation (Yukl & Tracy, 1992).

Assumptions

The content analysis is qualitative and quantitative, non-experimental, descriptive, and based on secondary data collected on the influence of leadership styles with process improvement. The Black-Belts and management should have a dominant influence style. The tests instrument should be validated. Control of unbiased assessment data and sample populations should be obtained. The culture of the articles selected should have minor influence on the influence style analysis.

Scope, Limitations and Delimitations

This study is limited to peer review journal articles. The study focused on preferred leadership and influence styles of leaders implementing Six-Sigma process improvement. The articles will be coded and analyzed with statistics.

The following limitations are a baseline guide to this research study:

1. The study was limited to peer reviewed journal articles in business organization settings.
2. Environment conditions could change the correlation relationship between the dependent and independent variables.
3. Five leadership styles was researched
4. The validation of the in leadership style coding was limited to data from 43 journal articles.
5. Phone interviews were given to Green and Black-Belts and coded.

The cross-sectional correlation method will have certain limitations for cause-effect relationships. Intervening variables may have some influence. Forty-three articles were investigated for the relationship between the dependent and independent variables. Data collection is collected from coding techniques of the article content and phone interviews.

Summary

The overview of Chapter One presents the relationship between Six-Sigma process improvement and leadership in styles. The leadership skills of Black-Belts and Managers determine the success of process improvement change models. This dissertation investigates leadership styles and successful Six-Sigma implementation.

Black-Belts and Management from the content analysis received a validated coding tool that measures the success of implementing process improvement. Content analysis with statistical methods analyzed the proposed hypothesis. Chapter Two covers influence styles and leadership through the inclusion of multiple related studies.

CHAPTER TWO: LITERATURE REVIEW

Six-Sigma Methodology

The research study uses a content analysis coding theme instrument with statistical analysis. This section will explore the effects of influence styles on Black-Belts and management leadership. The independent variables are (a) pressure, (b) consultation, (c) persuasion, (d) inspiration, (e) exchange tactics by Yukl and Falbe (1990). The articles researched came from peer reviewed journals allowing researched data to compare and contrast leadership influence styles' effect on process improvement.

Key search indices used were EBSCO and PROQUEST with keywords Six-Sigma, Leadership, and Black-Belts. The historical view of leadership influence will be compared in the articles, and their relationship with the independent variables. Six-Sigma movement was led by Mikel J. Harry, and Motorola takes credit for the implementation standards (Harry & Stewart, 1988). The structured approach of DMAIC specified what management supports implementing process improvement in the workplace (Basu, 2001).

Mikel Harry (1988) developed the Six-Sigma methodology in the late 1980s to offer a repeatable sustainable approach to data-driven solution techniques for business problems. Harry argued that every problem can be viewed as a process having inputs and outputs. The data driven approach would use math and statistics tools to determine the root cause of the problem. The five phase process was developed with these terms: Define, Measure, Analyze, Improve, and Control (DMAIC) (Harry, 1988). Define is the first phase of Six-Sigma in which leaders allow input from middle management and

subordinates. The problem is defined with a process, benchmarked, goal and project oriented, project teams defined, and project timelines developed.

Measurement is the second phase in which the project team maps a business process to explore variable effects on a process with inputs and outputs. The leaders of the projects are Black-Belts who focus the team on analyzing the measurement systems. The output is examined for repeatability, sustainability, stability and process capability (Harry, 1997). Analyze is the third phase using statistical tools to determine the relationships between variables of the input and output process. The data collection is performed and analyzed for root causes. Control design experiment tools are used to validate the process analyzed (Eckes, 2003). Improve is the fourth phase in which the leader brainstorms the solution to eliminate the root cause of the defect validated during the analyze phase. Solutions are reviewed for repeatability, reproducibility, stability, and capability. Pilot studies are developed with the solution, and if successful, a full scale implementation of the solution is carried out. The last phase is control which focuses on procedure development capitalizing the sustained progress in the Improve phase. Continuous improvement is applied to the process to eliminate reoccurring defects affecting a stable controlled process (Harry, 1988).

Benefits of Six-Sigma

Six-Sigma offers a disciplined approach for improving business and manufacturing processes if implemented successfully. Customer satisfaction is the most cited benefit in the literature (e.g. Behara et al., 1995; Chen et al., 2005; Das et al.,2006; Desai, 2006; Douglas & Erwin, 2000; Ganesh, 2004; Kuei & Madu, 3002; Kumar et al., 2007; Rylander& Provost, 2006). The application of Six-Sigma quality correlates to

better financial performance and profit (Freiesleben, 2006). Six-Sigma benefits manufacturing by reducing variability, process defect levels , maintenance inspection time, cycle time, on-time delivery, increasing savings, profitability, reduction of operation costs, cost of poor quality, customer satisfaction, reduced inspection, and waste elimination (Antony et al., 2005, 2007a; Kwak and Anbari, 2006). Lean Six-Sigma is an improvement methodology that improves cost, quality, process speed and invested capital by eliminating waste and reducing variation within an organization (Byrne et al., 2007).

Black-Belt Leadership

Black-Belts serve as tool mentors, internal change agents, and single contributors for a company working across organizational disciplines (Rath & Strong, 2003). Black-Belts are professionals from various work professionals with a focus on high quality standards. These employees are specifically trained to acquire a Black-Belt certification. Black-Belts stimulate management by using process improvement innovation tools to drive efficiency. Other departments are developed to follow in the successful changes implemented (Harry, 1997). Black-Belts teach and coach the Six-Sigma strategies as key contributors to process improvement (Harry, 1997). Black-Belts work in environments that include manufacturing, engineering, finance, construction and other fields in pursuit of higher quality output (Eckes, 2001). Technology has increased in computing, allowing Black-Belts to perform statistics measuring Six-Sigma standards. Statistical computer software for example SPSS, Minitab, and Microsoft Excel provide solutions in a short time frame.

Champions

Champions are management executives in the company that sponsor Six-Sigma projects. They ensure that resources are provided for projects. Their presence is seen during the projects showing leadership involvement and support for the Black-Belt tool implementation of Six-Sigma. Champions inform senior management of the project's success benefit to the company (Rath & Strong, 2003). Champions must be trained in the technical tools and concepts of Six-Sigma to support the improvement process of change (Berger, 2003). Each Black-Belt has a champion to support their projects. The projects are mission critical with a financial savings. The training of champions is critical to the success of Six-Sigma tool implementation. Champions require the basic knowledge of understanding the concepts to support the Black-Belt with formal project reviews for visibility and site participation. The training enables leadership engagement and support necessary for project operating cost approval and work interruption problem solving projects (Berger, 2003; Eckes, 2003).

Leadership Review

Research efforts are focused on investigating specific influence styles demonstrated by varied levels of management, and how their followers are affected by decisions and actions (Kiipnis et al., 1980; Mowday, 1978; Yukl & Falbe, 1990). The relationship of the styles and tactics are limited in the Six-Sigma change model. Several studies have examined the influence styles relating to personality (Buckle, 2000); influence (Yukl & Tracey, 1992; Falbe & Yukl, 1992), gender (Thacker, 1995), and motivation (Barbuto, Fritz, & Marx, 2002). Influence is defined as a manager exercising power over subordinates to dispel any resistance to a desired goal. Power is the ability to

affect the subordinate's attitude and behavior (Hinkin & Schriesheim, 1990). In order to understand organizational behavior, Mintzberg (1983) argues that influencers must be understood while exercising their power and examine the motive that drives them to fulfill those needs. Factors for this influence are decisions and action control in the organization (Mintzberg, 1983).

Leadership falls under two broad categories termed consideration and initiating structure (Bass, 1990, Yukl, 1994). Consideration is the leader's supportive manner for subordinates with a friendly approach that shows concern. Initiating structure is the leader's definition of his goals for the department or mission of the company (Yukl & Tracy). Wren (1995) argues that effective leadership moves a team with long-term goals. The leadership definition explores the factors that stimulate leaders to support innovation, change, and self-improvement to lead change (Bass & Wren, 1995). The development process of a leader is seen when the leader adapts to the environment challenges and recognizes the strategy to enhance leadership skills. French and Raven (1959) argued that an individual's ability to deliver coercion and rewards empowers leadership to a leader-follower relationship.

Leaders and Followers

Leadership is important but followers are essential for a relationship to form. Leaders reinforce followers with guidance towards compliance of work requirements. The leader must have the capacity to solve problems and mediate issues that involve rational problem-solving. Leaders must also sense the mood and needs of their staff (Wren, 1995). Kipnis, Schmidt, and Wilkinson (1980) sampled students with a questionnaire reflecting the influence techniques. The study revealed that managers use

different influence tactics to get support for their objectives. The questionnaire stimulated future studies to review other research questions on managers' tactic patterns of influence on subordinates (Kipnis & Schmidt, 1988). Research has focused, in recent years, on specific influence strategies that affect followers referencing the Six-Sigma change model. Kipnis et al. (1980) studied influence among early researchers revealing influence tactical behaviors designed to control another person's attitude. Consultation and rational persuasion were frequently used according to Yukl and Falbe (1990).

Influence Styles

Managers use two influence styles to direct subordinates on organizational goals termed direct interpersonal and indirect structural influence styles. Direct interpersonal supports a hierarchical interpersonal relationship influential with organizational design, vulnerable environment, and employee dynamic changes (Katz & Kahn, 1978). Direct and indirect influence behaviors cross national cultures defined as values, beliefs, norms, and traditions shared by different social groups passed down generations (Adler, 1991).

The leaders' power is not based on his combined sources but on the interaction between them. The interaction involves referent power and coercive power known for leadership exercising influence. Referent power comes from expert power or an influential person. Coercive power comes from persuasive speech or influence weakening referent powers influence (French & Raven 1959). Referent power amplifies the impact of different power sources such as legitimate, expert, and resource. Coercive power can dilute referent powers effect. Hinkin and Schriesheim (1990) discovered rationality to be the common used influence tactic by effective leaders. Different influence tactics used by leaders provides insight on their effectiveness. Appendix B

shows the definition of behavior with the tactic identified by Yukl and Falbe (1990) from literature. Cable and Judge (2003) explored why influence tactics are preferred by managers over others, and the results affect the culture of the organization. Researcher Mowday (1978) reported leaders seeking more power and progress use influence tactics.

Organizational Change

Change management literature has cited three models of change. The first model was developed by Kotter (1995) involving eight-steps for organizational change. The organizations varied in size and industry. Research revealed that most of change failed leading his model to support avoiding mistakes from the change process. Kotter's work noted that change is incremental in timed phases. His model is designed to support the strategic level of management leading the change process (Appendix A p.93).

The second model is a ten-step tactical level model developed by Jick (1991). His model evaluated the change in progress. Jick argues that change is an ongoing process and questions should be asked during the process. He noted the leaders' method of implementing change should equal the change in importance. The change agents should demonstrate sensitivity to subordinate views, recognizing change as a continuous process (Appendix A p.93).

The third model is an accelerated seven-step change process used at General Electric (G.E.) (Garvin, 2000). The model centers on the leader creating the vision and communicating the need for the change process. Discipline is the goal in the process likened to a pilot checklist making the information change more visible and accessible (Appendix A).

Summary

This chapter reviewed research on Six-Sigma, leadership, influence styles and change models. The historical perspective validated from Six-Sigma's origin that it was arguable to compare and contrast the effects of leadership styles in change management. The literature revealed that attention was given to Six-Sigma for demonstrated proof in the business trends of profit and what impact leadership plays along implementing tool usage.

Over the last 30 years, researchers have tested the theories linking leadership styles with bridging the gap between leaders and subordinates, and developed training that promoted positive change management. The broad scale success of positive influence requires more testing for current state as the industrial, business, and manufacturing environment changes constantly with a new generation of leaders. Many books were written by Six-Sigma consultants and objective researchers are few in number. Continued research should show how leaders are coping today with growing a lean business in any work environment using the proven tools of Six-Sigma led by Black-Belts and supporting Champions. Chapter Three describes the methods and processes applied using the content analysis method for collecting and analyzing of the data.

CHAPTER THREE: METHODOLOGY

The purpose of this content analysis research study utilizes the self-assessment of influence tactics and Six-Sigma tools with statistical analysis. The dependent variable is the success of process improvement and cost reduction. The independent variables are (a) pressure, (b) consultation, (c) persuasion, (d) inspiration, and (e) exchange by Yukl and Falbe (1990). The content analysis will aim to investigate the preferred influence styles of leaders implementing Six-Sigma, and which style has more influence on the success of Six-Sigma.

Framework and Hypothesis

The questions of this research address the success of Six-Sigma under the influence of leadership and how subordinates' performance is affected. The hypothesis reflects Yukl and Falbe (1990) influence tactic styles that tested managers and subordinates response. The response is correlated with the leaders' influence style and Six-Sigma improvement process.

Ho – There is no difference in management styles when implementing process improvement

Ha – There is a difference in management styles when implementing process improvement

H1o – There is no difference in project completion between management styles

H1a – There is a difference in project completion between management styles

The second hypothesis is the leaders' success implementing process improvement with specific influence styles. The Six-Sigma projects would have a higher ratio of completion and success with cost savings. Six of the eight Yukl and Falbe (1990)

influence styles are reviewed to contrast and compare influence styles. Leadership styles are used in different directions and are flexible regarding information's logic and facts.

Black-Belts provide leadership in Six-Sigma with successful projects and cost savings (Wiklund & Wiklund 2002.) Leadership is important for success and managers rely on the measured results. The projects can, for example, be simple office organization for efficiency or lean projects for cost reduction.

Research Methods

This study utilized a quantitative method to determine the effect of five independent variables. The variables are pressure, consultation, persuasion, inspiration, and exchange. The content analysis reviewing variables developed by Yukl and Falbe (1990) will measure variables. The content analyses of articles review Six-Sigma Black-Belts and managers who support the projects. This analysis compared data across researched journal articles comparing the independent variable influence.

Qualitative Content Analysis of Articles

Content analysis was used in many types of research applications in information library science (ILS) (Allen & Reser, 1990). Qualitative content analysis incorporates subjective interpretation of text data by coding themes or patterns (Hsieh & Shannon, 2005, p.1278), the empirical, methodological text analysis within communication using step models while eliminating rash quantification (Mayring, 2000, p.2) and qualitative data reduction to identify consistent themes (Patton, 2002, p.453).

The qualitative process reduced data into logical conclusions, known or assumed, to be correct. The directed content analysis was used starting with a theory, and allowed the researcher to immerse into the data and emerge validating the conceptual framework

(Hsieh & Shannon, 2005). The goal was to examine the information seeking leadership styles of Black-Belts and managers implementing Six-Sigma in companies from 43 journal articles. The articles reflected an exploratory inquiry into leadership styles involving (a) pressure, (b) consultation, (c) persuasion, (d) inspiration, and (e) exchange appeal by Yukl and Falbe (1990).

Research Design

The non-experimental design does not use a control and the content analysis determined a cause of effect with common repeatable influence factors. The statistical review of relationships between several variables showed the leading influence factor supporting successful implementation delivering the benefit of Six-Sigma tool usage (Leedy & Ormond, 2001).

Content Analysis Research Design

The Table in Appendix C (p.97) reflects the research techniques for the objective, systematic, and quantitative description of the manifest content of leadership styles.

Population under Study

The research study used a qualitative and quantitative Content analysis where the data is non-experimental and secondary research was collected from articles on Black-Belts and department managers implementing Six-Sigma. The variations in the independent variables are related to the dependent variables on influence styles. The Black-Belts and managers in the company represent the population for the study. Black-Belts perform the Six-Sigma analysis and engage management to incorporate change promoting efficiency in the organization (Harry & Schroeder, 2000). Managers

are the executive staff that sponsors Six-Sigma projects (Brue, 2002). The Black-Belts hold certifications to lead Process Improvement and Continuous Improvement.

Significance of the Research

The research explored the leadership influence styles with Six-Sigma implementation comparing and contrasting leaders supporting role in the change process. The comparison revealed the potential failure points in leading change showing the leaders influence relative to the Six-Sigma tools used. The relationship revealed the effectiveness of the tool usage combined with leadership influence styles.

Sample Method

The population study sampled 43 Articles from peer reviewed journals researching Six-Sigma tools effect on leadership influence in companies worldwide. The articles centered on the Six-Sigma tool usage covering variation in leadership engagement. Three Black-Belts and three Green-Belts were phone interviewed on key influence styles for quantitative data analysis.

Setting of the Study

The manufacturing and business environment was viewed from peer reviewed journal articles with experiences from various industry settings. Some example businesses open to all environments that benefit from Six-Sigma is hospitals, schools, manufacturing, stores, and any organization requiring management decision making. Phone interviews from current Black and Green-Belts in manufacturing and business settings were performed to reflect the current state of leadership style influence.

Research Instrumentation

The content analysis tool reviewed 43 articles from peer reviewed journals. A researched content analysis procedure determined the universe of the content to be analyzed (journal articles). A sample was analyzed. The data coded specified the following units of analysis:

1) Single word or symbol,

2) Theme,

3) Sentence or paragraph,

4) Entire article,

5) Character

Decisions are made on the system of enumeration using time and space measurements (Berelson, 1952).

Data Collection Procedure

The hypothesis supporting the conceptual framework was implemented in the researchers outline in Figure 1. The influence styles were verified in the hypothesis and statistical summary. Data from a Content analysis of articles was analyzed and charted to show common themes of words reflecting leadership influence styles. The data was collected from 20 to 40 minute phone interviews using a digital hand held recorder to record the conservation. The interview process took three weeks. The recordings were later reviewed and coded with themes and the data was transcribed into a word document. The interviewees were notified that the recordings would not be used for any other purpose than to transcribe and code the data. The interview was conducted with 11 verbal questions over the phone. The interview was informal with focus on three

leadership styles. The questions explored the participants view based on current experience.

Data Organization

Data was gathered from peer reviewed journal articles and content analysis of the articles. Data was gathered from phone interviews. Data was entered in statistical software using analysis of variance (MANOVA), and correlations. Descriptive statistics with frequencies, multi-variate, and bivariate analysis was performed. The phone interviews were transcribed and entered into a word document and saved with a coded filename. The names of the participants are not associated with the fine name. The dissertation chair assisted in the coding of the interviews.

Data Analysis

Data analysis of the leadership influence styles reflected the common styles used more by the Black-Belts, Green-Belts and Managers that show more or less influence of the independent variables. Optimal leadership with cost savings should reflect successful projects and Six-Sigma methodology implementation. Positive, negative, and no correlation will reflect Six-Sigma and influence style factors and their relationship. The quantitative analysis used descriptive analysis with charts reflecting the content analysis of 43 articles and the word themes associated with each article. The association of the words explored the leadership styles with higher word counts and stronger association with styles of greater influence. The data was reduced by simplifying word count associated with each article. The Data displayed in charts identified the relationships between variables showing patterns, themes and differences between the leadership styles. The conclusions from the charts reveal patterns in the word content showing

consistencies in the data from 43 articles. The Qualitative analysis reviewed the leadership style with the strongest association to the content words narrowing down the top leadership styles for an objective focus from the phone interviews on the top styles.

Internal External Validity

The content analysis coding and developing category systems is used to measure both the dependent and independent variables. The internal validity study eliminates any extraneous variable that interfere with variables being studied (Creswell, 2003). The five influence styles were developed conducting exploratory factor analysis. Validity measures were tested in many studies supporting the instrument as one of the better tools to measure influence styles (Yukl & Falbe, 1990). Coding results generalized to organizations at large will promote high external validity. The external validity of this study was limited due to generalized findings to other organizations being limited. The phone interviews covered Black-Belts and Green Belts employed from several organizations in several geographical locations from the Midwest to the east of the continental United States. The variation showed strong views on the leadership styles and the strongest styles of focus.

Summary

The hypothesis in this study explored the influence style and Six-Sigma implementation success with leadership in organizations. The research design reflected recent information in organizations and showed the positive or negative success of Six-Sigma implementation. The relationship between leadership influence styles and Six-Sigma implementation produced predictive correlations on the impact of improper implementation of process improvements by certified Six-Sigma experts.

CHAPTER FOUR: DATA ANALYSIS

Restatement of Purpose

This study was non-experimental and secondary research using quantitative and qualitative methods. The effects of leadership influence styles are examined through content analysis on the dependent variables black-belt, manager, champion, project, employee, and Six-Sigma. The independent variables were pressure, consultation, persuasion, inspiration, and exchange. The independent variables correlate with the dependent variables to review the relationships influence on process improvement in an organization. The qualitative analyses include subjective interpretation of text data by coding themes or patterns (Hsieh & Shannon, 2005, p.1278).

The researcher explored content analysis used in many research applications in information Library science (ILS) (Allen&Reser, 1990). The text data from coding themes with statistical summary, bivariate correlation, and MANOVA data analysis examined the primary article content data to explore relationships between leadership styles and their impact on process improvement. The data was collected from 43 journal articles on Black-Belts and organization leadership implementing Six-Sigma. The article content breadth and depth varies with each subject's emphasis on process improvement. The code sheet contains 12 variables for word content, and five themes for trends. Two variables reflect the article's overall positive or negative support of Six-Sigma and process improvement. The 12 variables were coded to reflect each variable's relationship as negative or positive with the article's content correlating with the leadership style. The seven dependent variables were Black-Belt, Leadership, Manager, Projects, Champion, Six-Sigma, and Subordinate.

The researcher developed a code book with descriptors and measurements of leadership styles. The code book reflected the extent of the collection and processing. The file structure, cases, variables, and record lengths were recorded. The variables were listed and described. The five themes are listed, and the positive versus negative views were described for each article to display the word count descriptive. The analysis code sheet listed the coders name, article name, date coded, and date of article. The numbers of mentions were listed for each word variable V1 – V12. Each article had a positive or negative choice reflecting the article's view on the variable. The themes are listed last with a circle to check for yes. Yes reflects the theme is supported in the article and no reflects the theme is not supported.

The researcher described the 12 variables starting with the first five as independent, and the last seven as dependent. The five independent variables described by Yukl & Falbe (1992), target influence tactics. The first variable, pressure, supports the use of threats, demands, and reminders to exert influence. Pressure tactics should have an impact on individuals low in agreeableness reflecting less importance on being liked and acting soft hearted (Barrick & Mount, 1991). The second variable, consultation, seeks participation in strategic planning for change acceptance tactics. Ceasar, (2002) argued that for self-directed work teams, task commitment should be used for consultation to strengthen relational ties with managers. Yukl (1994) noted the influence tactic supports proactive influence behavior. The third variable, persuasion, uses logical arguments and evidence to convince a subordinate of doing projects with success. The fourth variable, inspiration, appeals to values and ideals while the leader stimulates

enthusiasm in the subordinate. The fifth variable, exchange, supports promises that include favors resulting in a future shared subordinate benefit.

The dependent variables six through 12 are Black-Belt, Leadership, Manager, Projects, Champion, Six-Sigma, and Subordinate. The Black-Belt variable investigates their dedication to the Six-Sigma initiative. They are experts with statistical analysis for process improvement (PI) and a full time team leader. Black-Belts are leaders in an organization using Six-Sigma and their leadership styles influence the projects. The leadership dependent variable represents all leadership within an organization, and the unified momentum is viewed for the support or lack of support in process (PI). The manager dependent variable views mid-level managements position working with Black-Belts leading (PI). The project variable looks at projects led by the leadership of the organization arguing their influence style impact as strong or weak supporting (PI). The champion variable views upper management's support of Black-Belts on projects. Black-Belts have champions for each project. The Six-Sigma variable looks at the usage of Six-Sigma tools and who supports the tool usage. The subordinate variable observes the employee's response to leadership styles and which one has the highest influence. The independent variables are shown in the tables below breaking down the word frequency of the variable in each article. The articles with the highest frequency are observed in the percent column of the tables.

Qualitative analysis was used in phone interviews with Black and Green belts exploring their leadership styles in work environments. The interview explored the participants' views on their work leading projects and the positive and negative experiences leading to lessons learned. The experiences also showed the

recommendation for leaders focus on results exercising leadership styles in a blended variation dependent on changing demands for process improvement.

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Results from Interview Questions

Leadership Styles Bank – Pressure – Part A

Interview # 1 (Appendix G)

1. Pressure from manager
2. Used different methods for movement
3. Yes (constant user) for deadlines

Interview # 2 (Appendix G)

1. Pressure from consolidation of Bank
2. Time constraints, tracking
3. No (constant user) effective in beginning

Interview # 3 (Appendix G)

1. Pressure from deadline
2. Used Supervisor for movement
3. No (constant user) sometimes to meet deadlines

Interview # 4 (Appendix G)

1. Pressure from meeting on time delivery
2. Used politics for movement
3. No (constant user) only on short term projects

Interview # 5 (Appendix G)

1. Pressure to take job serious
2. Used time management for movement with bottlenecks
3. No (constant user) set deadlines

Interview # 6 (Appendix G)

1. Pressure to install software and hardware
2. Used for emergency projects
3. No (constant user) only on crucial tasks

Leadership Styles Bank – Persuasion – Part B

Interview # 1

1. Explain critical functionality to get by-in (demonstrate)
2. Some and all. Varied with the situation
3. Persuasive, Yes on projects

Interview # 2

1. Created buy – in response to tactic
2. Most people responded (some)
3. Persuasive, Yes moderately on projects

Interview # 3

1. To show waste and use to influence change (demonstrate)
2. Typical for everyone due to lack of knowledge

3. Persuasive, Yes on projects

Interview # 4

1. To show systematic approach (demonstrate)
2. Typical for everyone
3. Persuasive, Yes on positive outcome cases

Interview # 5

1. To show the benefits of Six-Sigma
2. Typical for some – key players. They would convince the rest of the team.
3. Persuasive, Yes, shows benefits at start of the project

Interview # 6

1. Promote unity in projects
2. Used for some participants
3. Persuasive, Yes. Software development deadlines

Leadership Styles Bank – Inspiration – Part C

Interview # 1

1. Inspirational, Yes to complete projects
2. Good work ethics and doing the right thing
3. A stable environment is the benefit, always worked, most projects were completed
4. No time of less effect
5. Inspiration is the strongest.
6. Leaders should let people get engaged with ownership of the process

Interview # 2

1. Inspirational, Yes had impact on performance
2. Influence individuals for better performance
3. The motivation factor, always worked, most projects were completed
4. No time of less effect
5. Persuasion is strongest
6. Leaders should trust their staff their judgment

Interview # 3

1. Inspirational, Yes all the time. Positive impact
2. Get more individuals involved in the projects
3. The projects are completed, always worked
4. Lack of interest in the project in a time of less effect
5. Inspiration is the strongest leadership style
6. Leaders should recognize that individuals will follow good leaders

Interview # 4

1. Inspirational, Yes uses it to sell vision to individuals
2. It means you believe in outcome using the CI tools
3. Positive energy is the benefit, always worked, most projects were completed
4. The effect is less implementing short term goals
5. Inspiration is the strongest
6. Leaders should recognize that people make the company. Sell the vision with inspiration and be a part of it.
7. Uses empowerment to motivate his staff.

Interview # 5

1. Inspirational, Yes inspire with motivation
2. Having support and buy – in from staff
3. There was a time it didn't work. Backfired due to failed project, but most projects were completed overall
4. Time of less effect required Push and regroup
5. Persuasion is the strongest
6. Tell leaders, focus on cost savings and the company bottom-line

Interview # 6

1. Inspirational, Yes
2. To build, and bring out the best in the participant
3. Benefits from positive returns of work performance, always worked , most projects completed
4. No time of less effect
5. Strongest is Inspiration
6. Leaders should get involved in motivating others and be fully engaged.
7. Transformation is idea of leadership for next research topics

Table 1

Highest Support for Leadership Styles from Black and Green-Belts.

Questions	Pressure	Persuasion	Inspiration
1.	33% Deadlines		
2.	33% Time needed		
3.	83% Not constant user		

1.		66% Demonstrate	
2.		66% Typical for Some	
3.		100% yes Persuasive	
1.			100% Yes Insp.
2.			83% Pos. Influence
3.			83% always worked
4.			66% no time of less effect
Most supported	0	2	4
Total Support	49.9	77	83

Qualitative Analysis Documentation

Table 2
Content Analysis (Miles & Huberman, 1994)

Specific Data Sets in Use	Decision Rules	Analysis Operations			Conclusions Drawn Research Comments
		Ready Data	Drawing conclusion	Confirming conclusion	
Raw Utterance: The dialog with the Black and Green-Belts	Setting – phone Interview - protocol	X			Black and Green belts experience variation in different motivation styles
Recorded Interview: Recorded by digital recorder and stored on CD for storage in a locked cabinet	Recorder – digital – transfer to laptop for coding	X			Three of the five independent variables show strong correlations from content and phone interviews

Transcribed Interview: 1) Phone interview transcribed into MS word and saved in one file on a personal computer. 2) Interviews were coded from themes	Researcher transcribes interviews with Chair.	X	X		Independent variables Pressure, Persuasion and Inspiration have the strongest correlations.
Pressure Leadership style: 1) Opinion 2) Experience 3) Success	Rule for affect and motivation for project success: Did pressure make a difference	X	X	X	1. Opinions differ for meeting deadlines and time management 2. Strong support for not using this style all the time but as needed
Persuasion Leadership style: 1) Opinion 2) Experience 3) Success	Rule for usage and effect on work completion: Did persuasion make a difference	X	X	X	1. Leaders demonstrated influence better 2. Leaders found this as a stronger style to use. 3. The effect was stronger on positive participation
Inspiration Leadership style: 1) Opinion 2) Experience 3) Success	Rule for personal impact and influence on subordinates: Did Inspiration make a difference	X	X	X	1. Strongest acceptance of this as a personal trait 2. Opinion strong for it always working to influence workers 3. 1/3 instances of weaker effect 4. High project completion
Most Preferred Leadership Style Styles that currently worked best: 1. Inspiration 2. Persuasion 3. Pressure	Rule: Black and Green Belts give personal preference for most to least preferred style	X	X	X	1. Most preferred Inspiration 2. Stronger preference 3. Weak in preference

Quantitative Data Analysis and Statistical Significance

Tables and figures 3 to 15 reflect the content analysis word count correlation to the variable. Table 16 to 25 shows the statistical significance of the variables and that there is a difference in management styles when implementing process improvement. The MANOVA shows which variables are statistically significant. Follow the tables and figures to see which variables were strongest in the content analysis article review, and review the telephone interview of the Black and Green Belt leaders reflection on the variables with recommendations based on current experiences in their leadership roles.

Table 3

Word Count Summary of 43 articles:

Variable	N	Mean	Std Dev	Variance	Range	Minimum	Maximum	Sum
Total Positive	43	9.49	1.50	2.26	7.00	5.00	12.00	408.00
Total Negative	43	1.56	1.10	1.20	4.00	.00	4.00	67.00
Pressure/Force	43	4.77	6.47	41.80	31.00	.00	31.00	205.00
Consultation/Conferen	43	2.35	2.76	7.61	13.00	.00	13.00	101.00
Persuasion/Influence	43	14.14	33.04	1091.84	165.00	.00	165.00	608.00
Inspiration/Encourage	43	4.95	9.39	88.14	54.00	.00	54.00	213.00
Exchange/Transfer	43	1.91	3.51	12.32	21.00	.00	21.00	82.00
Black Belt	43	4.53	7.08	50.16	25.00	.00	25.00	195.00
Leadership	43	31.40	48.22	2324.91	190.00	.00	190.00	1350.00
Manager	43	15.30	19.25	370.41	82.00	.00	82.00	658.00
Projects	43	11.72	17.57	308.78	85.00	.00	85.00	504.00
Champion/Leader	43	31.56	72.39	5239.73	353.00	.00	353.00	1357.00
Six Sigma	43	67.91	107.47	11549.47	479.00	.00	479.00	2920.00
Subordinate/Employee	43	19.40	22.70	515.29	103.00	.00	103.00	834.00

The sum column shows the total word count for each variable independent and dependent. The total positive and negative variables T1, T2 show from the content analysis of 43 articles 408 positive responses vs. 67 negative. The 12 independent and dependent variables of each article were counted reflecting if the variable was found in

positive or negative support of Six-Sigma process improvement tool usage in organizations. The 43 articles revealed 84% positive support vs. 16% negative support.

Table 4 is the quantitative analysis of the independent variable pressure with descriptions of the word count and the number of articles in which the word pressure is found. As an independent variable it was compared with the other variables for strength of use and application in the articles. Pressure is a leadership style whose strength was compared with other independent variables and determined to make a difference compared to other leadership styles referencing the hypothesis statement. Pressure was the third highest word count of the five independent variables.

Table 4
Quantitative Analysis of Independent Variable Pressure/Force

Frequency		No. of Articles	Percent	Valid Percent	Cumulative Percent
Valid	0	8	18.6	18.6	18.6
	1	8	18.6	18.6	37.2
	2	3	7.0	7.0	44.2
	3	3	7.0	7.0	51.2
	4	9	20.9	20.9	72.1
	5	3	7.0	7.0	79.1
	7	1	2.3	2.3	81.4
	8	3	7.0	7.0	88.4
	10	1	2.3	2.3	90.7
	18	1	2.3	2.3	93.0
	20	1	2.3	2.3	95.3
	21	1	2.3	2.3	97.7
	31	1	2.3	2.3	100.0
	Total	43	100.0	100.0	

The word count for the pressure variable is 205. Eight of the articles do not mention the variable. Four articles have the highest number count of 31, 21, 20, and 18 at 43% of total count.

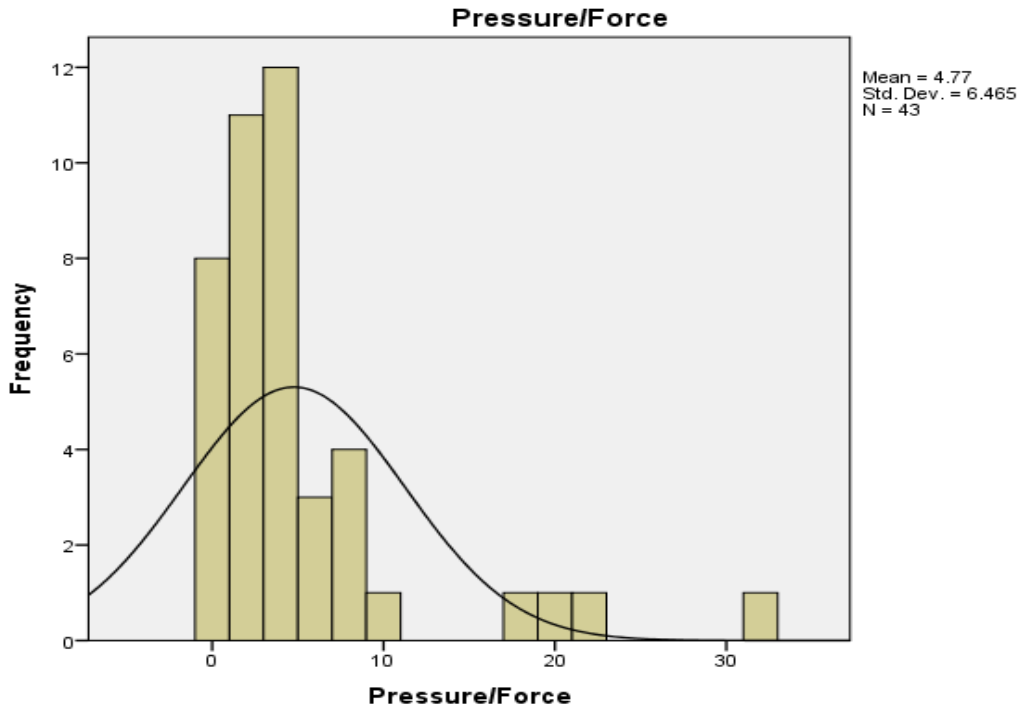

Figure 2. Thirty-five out of 43 Articles Discussed Pressure.

Table 5 is the quantitative analysis of the independent variable consultation with descriptions of the word count and the number of articles in which the word consultation is found. As an independent variable it was compared with the other variables for strength of use and application in the articles. Consultation is a leadership style whose strength was compared with other independent variables and determined to make a difference compared to other leadership styles referencing the hypothesis statement. Consultation had the fourth highest word count of the five independent variables.

Table 5
Quantitative Analysis of Consultation/Conference

Frequency		No. of Articles	Percent	Valid Percent	Cumulative Percent
Valid	0	9	20.9	20.9	20.9
	1	11	25.6	25.6	46.5
	2	11	25.6	25.6	72.1
	3	3	7.0	7.0	79.1

4	5	11.6	11.6	90.7
8	1	2.3	2.3	93.0
9	2	4.7	4.7	97.7
13	1	2.3	2.3	100.0
Total	43	100.0	100.0	

The consultation variable has 101 words in 34 of 43 articles. The highest count of one article is 13.

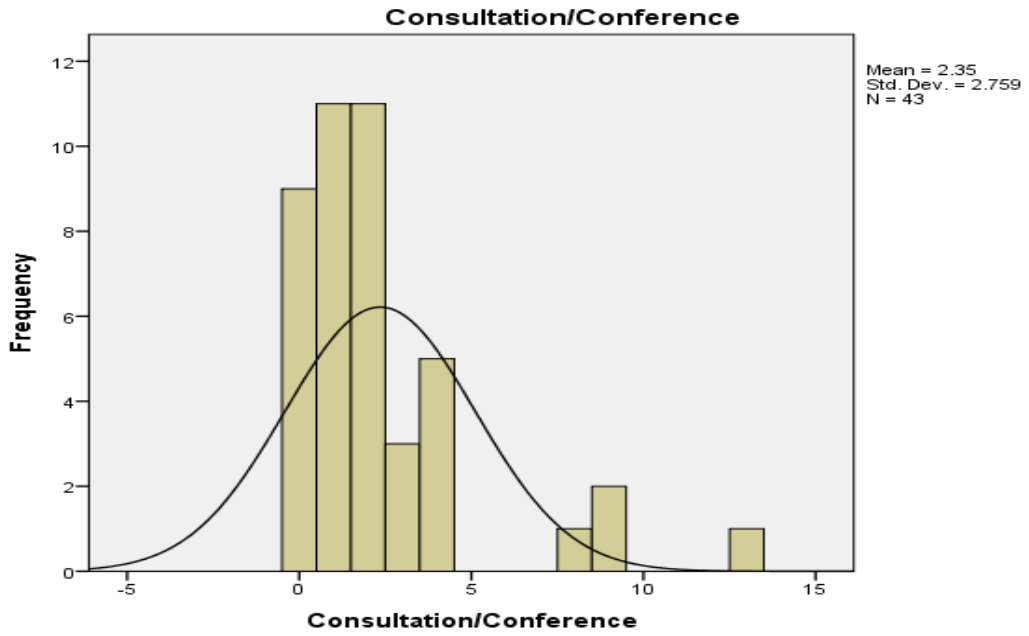

Figure 3. Thirty-four of 43 Articles that Discussed Consultation.

Table 6 is the quantitative analysis of the independent variable persuasion with descriptions of the word count and the number of articles the word pressure is found. As an independent variable it was compared with the other variables for strength of use and application in the articles. Persuasion is a leadership style whose strength was compared with other independent variables and determined to make a difference compared to other leadership styles referencing the hypothesis statement. Persuasion had the highest word count of the five independent variables.

Table 6
Quantitative Analysis of Persuasion/Influence

Frequency		No. of Articles	Percent	Valid Percent	Cumulative Percent
Valid	0	12	27.9	27.9	27.9
	1	7	16.3	16.3	44.2
	2	4	9.3	9.3	53.5
	3	2	4.7	4.7	58.1
	4	1	2.3	2.3	60.5
	5	1	2.3	2.3	62.8
	6	2	4.7	4.7	67.4
	7	2	4.7	4.7	72.1
	8	1	2.3	2.3	74.4
	12	3	7.0	7.0	81.4
	13	1	2.3	2.3	83.7
	27	1	2.3	2.3	86.0
	37	2	4.7	4.7	90.7
	43	1	2.3	2.3	93.0
	50	1	2.3	2.3	95.3
	136	1	2.3	2.3	97.7
	165	1	2.3	2.3	100.0
	Total	43	100.0	100.0	

The persuasion variable has 608 words. The highest count of four articles is 165, 136, 50, and 43 at 64% of total word count.

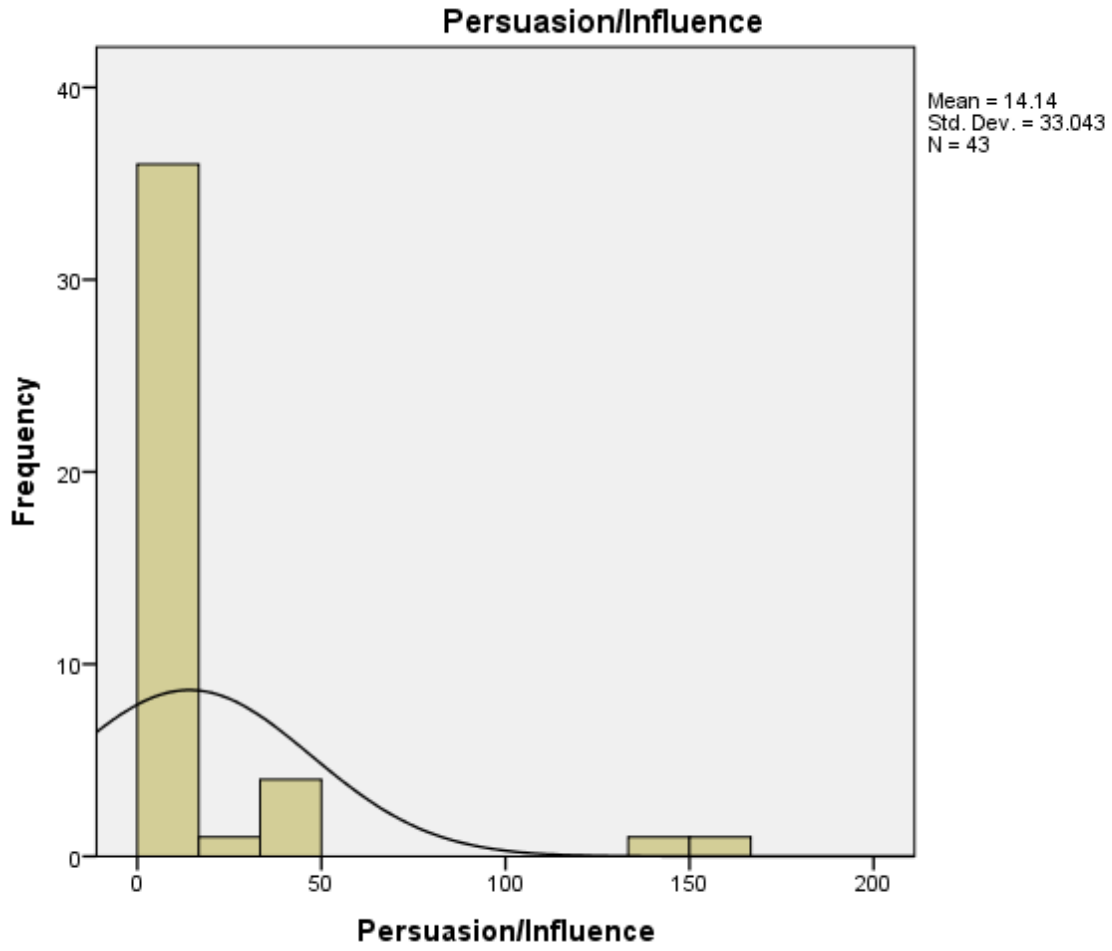

Figure 4. Thirty-one out of 43 Articles Discuss the Persuasion Variable.

Table 7 is the quantitative analysis of the independent variable inspiration with descriptions of the word count and the number of articles the word inspiration is found. As an independent variable it was compared with the other variables for strength of use and application in the articles. Pressure is a leadership style whose strength was compared with other independent variables and determined to make a difference compared to other leadership styles referencing the hypothesis statement. Inspiration has the second highest word count of the five independent variables.

Table 7

Quantitative Analysis of Inspiration/Encourage

Frequency		No. of Articles	Percent	Valid Percent	Cumulative Percent
Valid	0	15	34.9	34.9	34.9
	1	4	9.3	9.3	44.2
	2	6	14.0	14.0	58.1
	3	2	4.7	4.7	62.8
	4	2	4.7	4.7	67.4
	6	3	7.0	7.0	74.4
	7	1	2.3	2.3	76.7
	8	4	9.3	9.3	86.0
	9	2	4.7	4.7	90.7
	12	2	4.7	4.7	95.3
	30	1	2.3	2.3	97.7
	54	1	2.3	2.3	100.0
	Total	43	100.0	100.0	

The inspiration variable word count is 213 words. The highest word count of four articles is 54, 30, 12, and 9 at 49% to the total count.

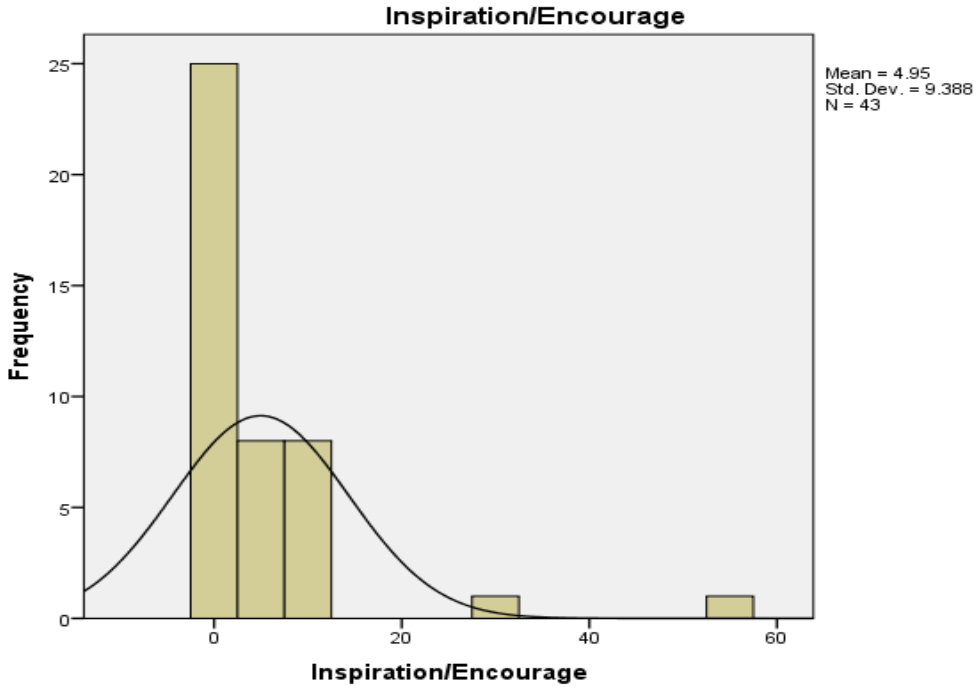

Figure 5. Inspiration Variable is Discussed in 28 out of 43 articles.

Table 8 is the quantitative analysis of the independent variable exchange with descriptions of the word count and the number of articles the word exchange is found. As an independent variable it was compared with the other variables for strength of use and application in the articles. Pressure is a leadership style whose strength was compared with other independent variables and determined to make a difference compared to other leadership styles referencing the hypothesis statement. Exchange was the lowest word count of the five independent variables.

Table 8

Quantitative Analysis of Exchange/Transfer

Frequency		No. of Articles	Percent	Valid Percent	Cumulative Percent
Valid	0	14	32.6	32.6	32.6
	1	16	37.2	37.2	69.8
	2	4	9.3	9.3	79.1
	3	3	7.0	7.0	86.0
	4	2	4.7	4.7	90.7
	5	1	2.3	2.3	93.0
	6	1	2.3	2.3	95.3
	9	1	2.3	2.3	97.7
	21	1	2.3	2.3	100.0
	Total	43	100.0	100.0	

The exchange variable word count is 82. The highest count of four articles is 21, 9, 6, and 5 at 50% of the total count.

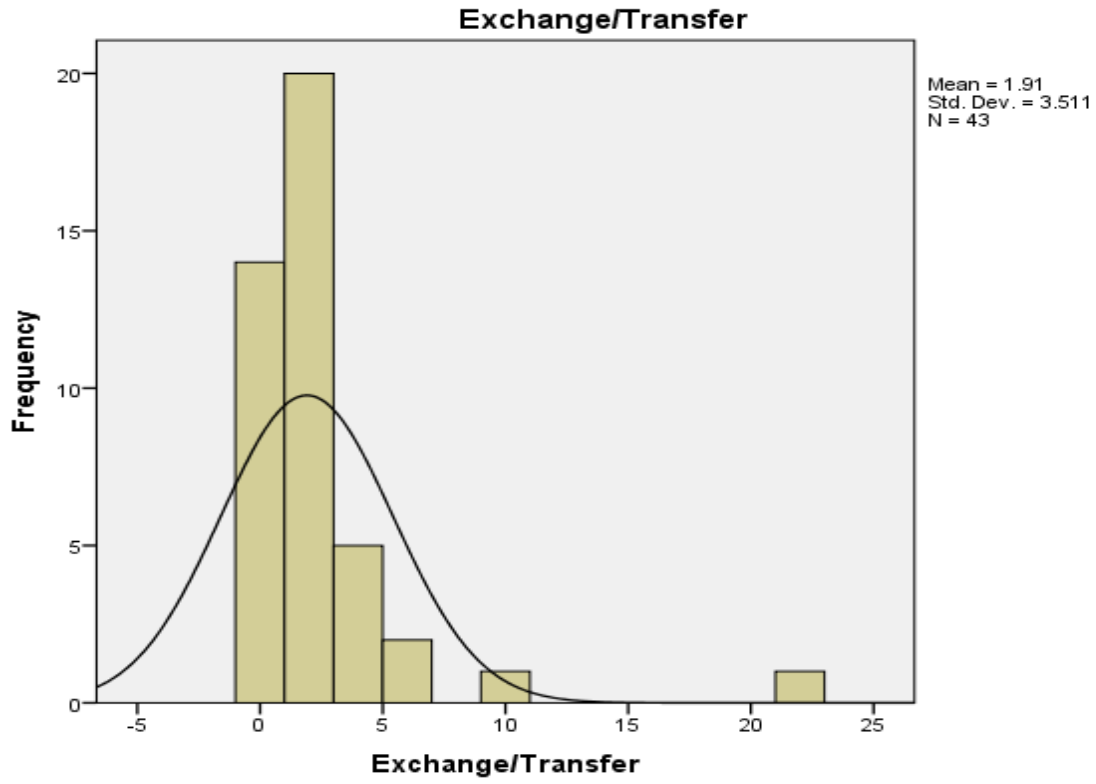

Figure 6. Twenty-nine of 43 articles discuss the exchange variable.

Table 9 is the quantitative analysis of the dependent variable Black-Belt with descriptions of the word count and the number of articles the word Black-Belt is found. As a dependent variable it was compared with the other variables for strength of use and application in the articles. Black-Belt is a leader whose content strength was compared to dependent and independent variables and determined to make a difference comparing five the leadership styles referencing the hypothesis statement.

Table 9
Quantitative Analysis of Black Belt

Frequency		No. of Articles	Percent	Valid Percent	Cumulative Percent
Valid	0	16	37.2	37.2	37.2
	1	8	18.6	18.6	55.8
	2	3	7.0	7.0	62.8

3	1	2.3	2.3	65.1
4	3	7.0	7.0	72.1
5	2	4.7	4.7	76.7
6	2	4.7	4.7	81.4
10	1	2.3	2.3	83.7
14	1	2.3	2.3	86.0
15	2	4.7	4.7	90.7
19	1	2.3	2.3	93.0
22	1	2.3	2.3	95.3
24	1	2.3	2.3	97.7
25	1	2.3	2.3	100.0
Total	43	100.0	100.0	

The Black-Belt variable has a 195 word count. The highest count of four articles is 25, 24, 22, and 19 at 46% of the total word count.

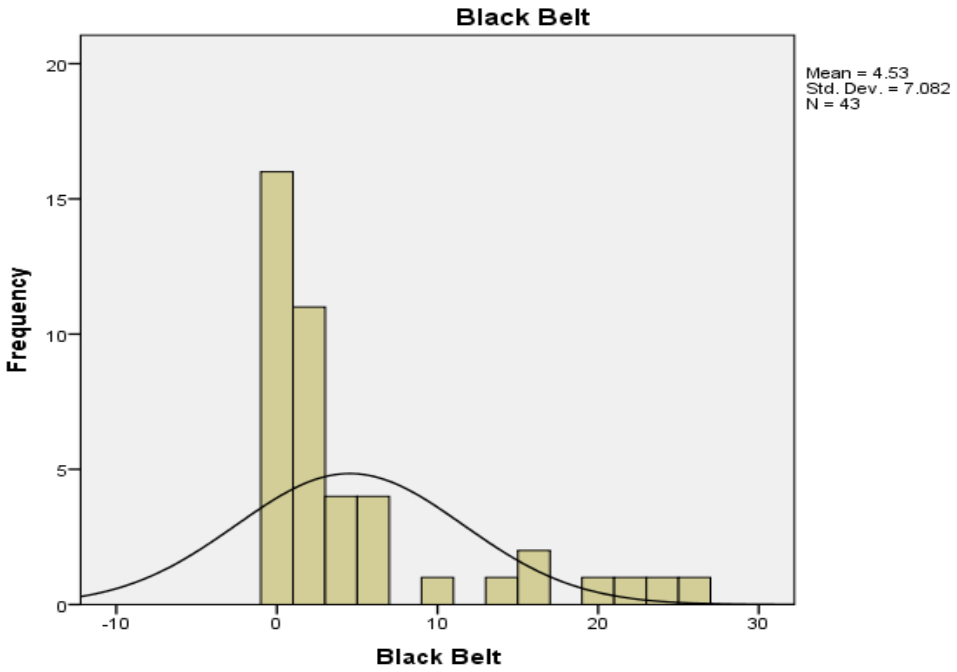

Figure 7. Twenty-seven of 43 articles discuss Black-Belts

Table 10 is the quantitative analysis of the dependent variable leadership with descriptions of the word count and the number of articles the word leadership is found.

As a dependent variable it was compared with the other variables for strength of use and application in the articles. Leadership is a leader's method whose content strength was compared to dependent and independent variables and determined to make a difference comparing the five leadership styles referencing the hypothesis statement.

Table 10
Quantitative Analysis of Leadership

Frequency		No. of Articles	Percent	Valid Percent	Cumulative Percent
Valid	0	1	2.3	2.3	2.3
	1	3	7.0	7.0	9.3
	2	2	4.7	4.7	14.0
	3	3	7.0	7.0	20.9
	4	5	11.6	11.6	32.6
	5	4	9.3	9.3	41.9
	6	1	2.3	2.3	44.2
	8	1	2.3	2.3	46.5
	9	3	7.0	7.0	53.5
	10	1	2.3	2.3	55.8
	11	1	2.3	2.3	58.1
	15	2	4.7	4.7	62.8
	17	1	2.3	2.3	65.1
	19	1	2.3	2.3	67.4
	20	1	2.3	2.3	69.8
	29	1	2.3	2.3	72.1
	35	1	2.3	2.3	74.4
	36	1	2.3	2.3	76.7
	45	1	2.3	2.3	79.1
	47	1	2.3	2.3	81.4
	54	1	2.3	2.3	83.7
	87	2	4.7	4.7	88.4
	99	1	2.3	2.3	90.7
	112	1	2.3	2.3	93.0
	142	1	2.3	2.3	95.3
	183	1	2.3	2.3	97.7
	190	1	2.3	2.3	100.0
	Total	43	100.0	100.0	

The leadership variable has a 1350 word count. The highest count of four articles is 190, 183, 142, and 112 at 46% of the total count.

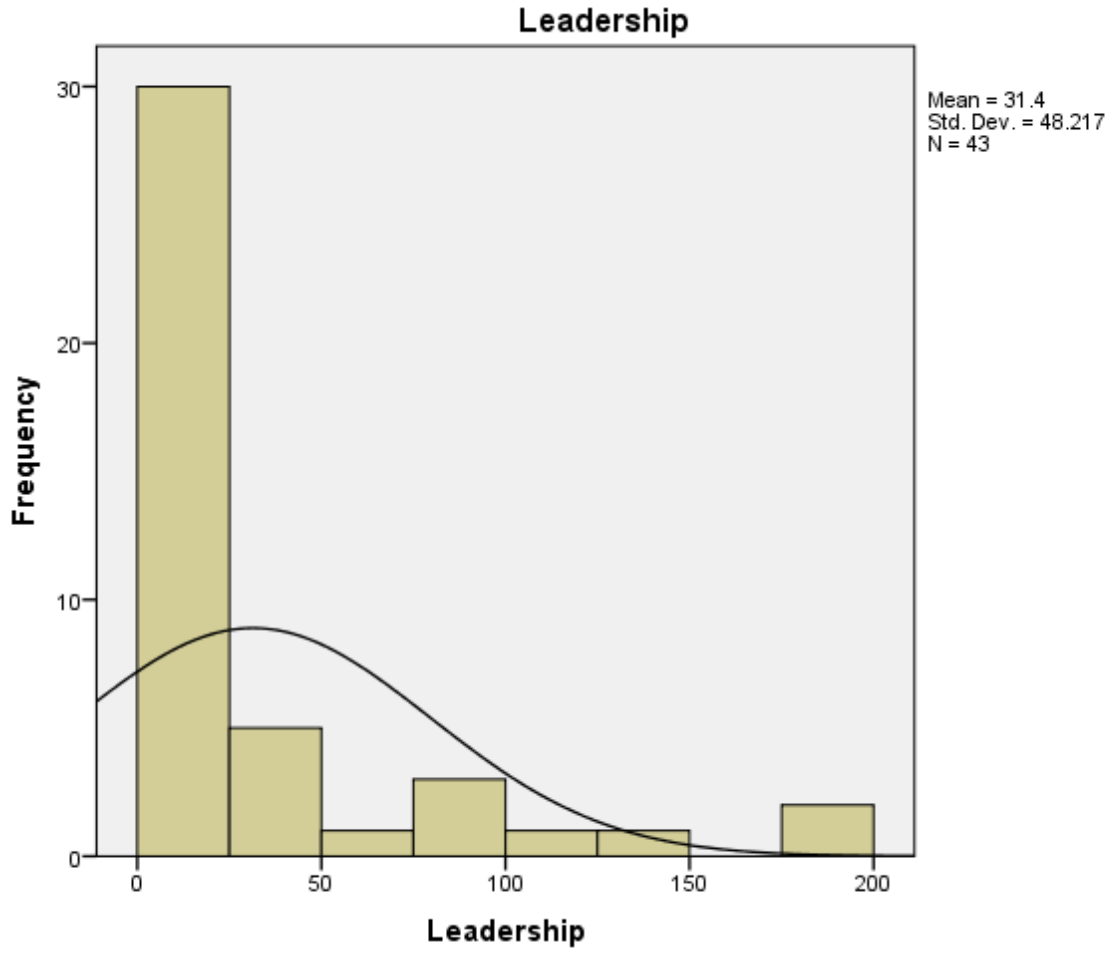

Figure 8. Forty-two Articles out of 43 had Leadership Discussions.

Table 11 is the quantitative analysis of the dependent variable manager with descriptions of the word count and the number of articles the word manager is found. As a dependent variable it was compared with the other variables for strength of use and application in the articles. Manager is a leader whose word content strength was compared to dependent and independent variables and determined to make a difference comparing the five leadership styles referencing the hypothesis statement.

Table 11

Quantitative Analysis of Dependent Variable Manager

Frequency		No. of Articles	Percent	Valid Percent	Cumulative Percent
Valid	0	1	2.3	2.3	2.3
	1	5	11.6	11.6	14.0
	2	2	4.7	4.7	18.6
	3	2	4.7	4.7	23.3
	4	5	11.6	11.6	34.9
	5	3	7.0	7.0	41.9
	6	3	7.0	7.0	48.8
	7	3	7.0	7.0	55.8
	8	2	4.7	4.7	60.5
	9	1	2.3	2.3	62.8
	10	1	2.3	2.3	65.1
	14	1	2.3	2.3	67.4
	16	1	2.3	2.3	69.8
	21	1	2.3	2.3	72.1
	22	1	2.3	2.3	74.4
	23	1	2.3	2.3	76.7
	24	2	4.7	4.7	81.4
	27	1	2.3	2.3	83.7
	35	1	2.3	2.3	86.0
	37	1	2.3	2.3	88.4
	39	1	2.3	2.3	90.7
	40	1	2.3	2.3	93.0
	55	1	2.3	2.3	95.3
	75	1	2.3	2.3	97.7
	82	1	2.3	2.3	100.0
	Total	43	100.0	100.0	

The manager variable has a word count of 658. The highest four single articles have a word count of 82, 75, 55, and 40 at 38% of total word count.

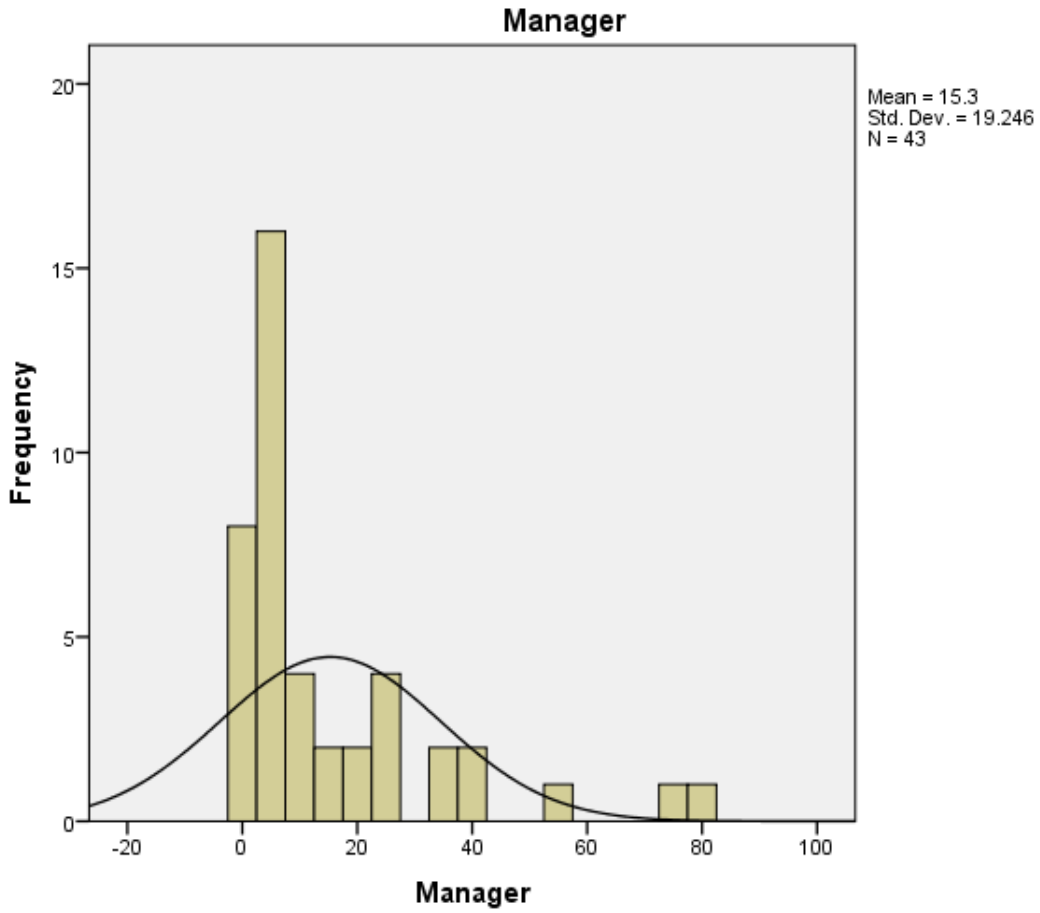

Figure 9. Forty-two of 43 Articles Discuss Manager

Table 12 is the quantitative analysis of the dependent variable projects with descriptions of the word count and the number of articles the word projects is found. As a dependent variable it was compared with the other variables for strength of use and application in the articles. Projects word content strength was compared to dependent and independent variables and determined to make a difference comparing the five leadership styles referencing the hypothesis statement.

Table 12
Quantitative Analysis of Dependent Variable Projects

Frequency		No. of Articles	Percent	Valid Percent	Cumulative Percent
Valid	0	6	14.0	14.0	14.0
	1	9	20.9	20.9	34.9
	3	4	9.3	9.3	44.2
	5	4	9.3	9.3	53.5
	7	2	4.7	4.7	58.1
	8	2	4.7	4.7	62.8
	9	2	4.7	4.7	67.4
	10	1	2.3	2.3	69.8
	12	1	2.3	2.3	72.1
	13	1	2.3	2.3	74.4
	14	1	2.3	2.3	76.7
	19	1	2.3	2.3	79.1
	21	1	2.3	2.3	81.4
	22	1	2.3	2.3	83.7
	25	1	2.3	2.3	86.0
	26	1	2.3	2.3	88.4
	27	1	2.3	2.3	90.7
	28	1	2.3	2.3	93.0
	53	1	2.3	2.3	95.3
	60	1	2.3	2.3	97.7
	85	1	2.3	2.3	100.0
	Total	43	100.0	100.0	

The projects variable has a word count of 504. The highest word count of four articles is 85, 60, 53, and 28 at 45% of the total word count.

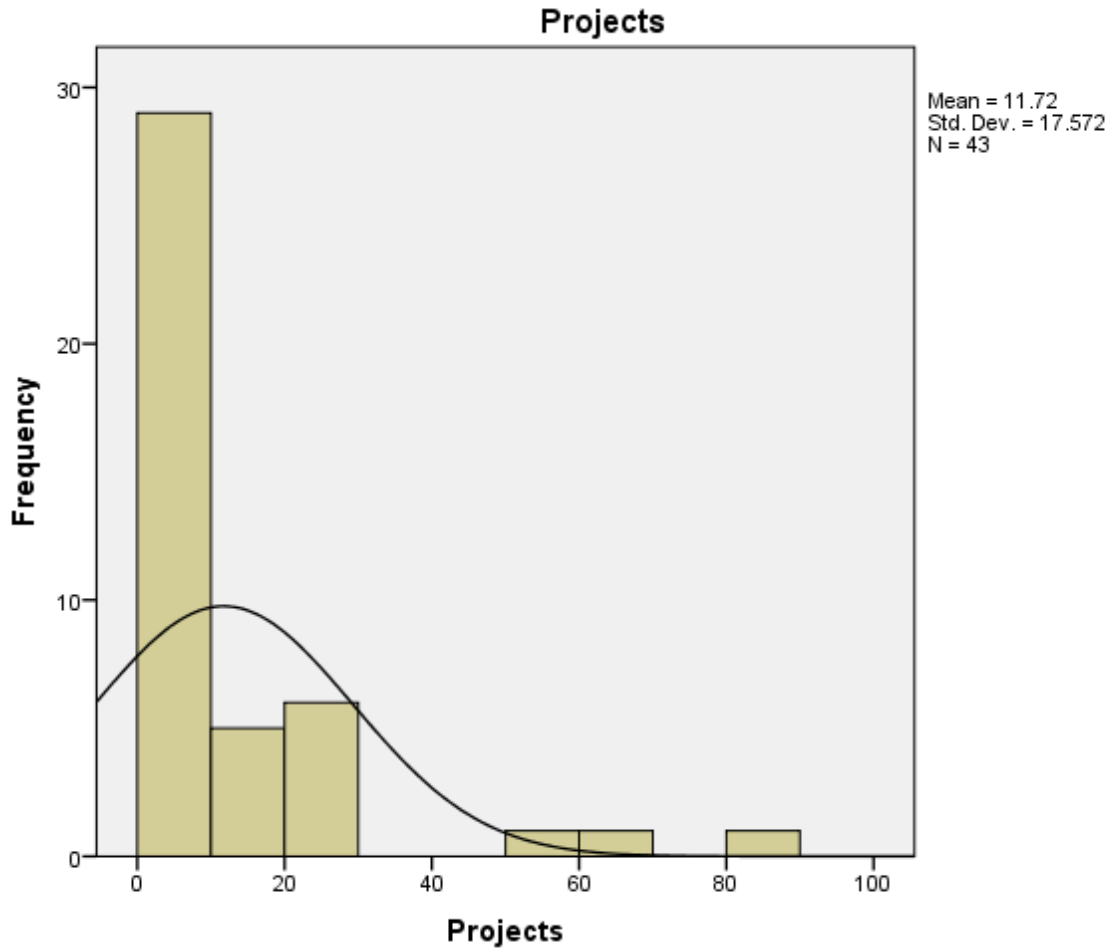

Figure 10. Thirty-seven out of 43 articles discuss projects.

Table 13 is the quantitative analysis of the dependent variable champion with descriptions of the word count and the number of articles the word champion is found. As a dependent variable it was compared with the other variables for strength of use and application in the articles. Champion is a leader whose word content strength was compared to dependent and independent variables and determined to make a difference comparing the five leadership styles referencing the hypothesis statement.

Table 13
Quantitative Analysis of Dependent Variable Champion/Leader

Frequency		No. of Articles	Percent	Valid Percent	Cumulative Percent
Valid	0	8	18.6	18.6	18.6
	1	3	7.0	7.0	25.6
	2	5	11.6	11.6	37.2
	3	1	2.3	2.3	39.5
	4	1	2.3	2.3	41.9
	5	3	7.0	7.0	48.8
	6	2	4.7	4.7	53.5
	7	2	4.7	4.7	58.1
	8	1	2.3	2.3	60.5
	10	1	2.3	2.3	62.8
	13	2	4.7	4.7	67.4
	14	1	2.3	2.3	69.8
	18	2	4.7	4.7	74.4
	24	1	2.3	2.3	76.7
	25	1	2.3	2.3	79.1
	28	1	2.3	2.3	81.4
	34	1	2.3	2.3	83.7
	39	1	2.3	2.3	86.0
	46	1	2.3	2.3	88.4
	75	1	2.3	2.3	90.7
	100	1	2.3	2.3	93.0
	239	2	4.7	4.7	97.7
	353	1	2.3	2.3	100.0
	Total	43	100.0	100.0	

The champion/leader variable has a word count of 1357. The highest four article counts are 353, 239, 100, and 75 at 57% of the total word count.

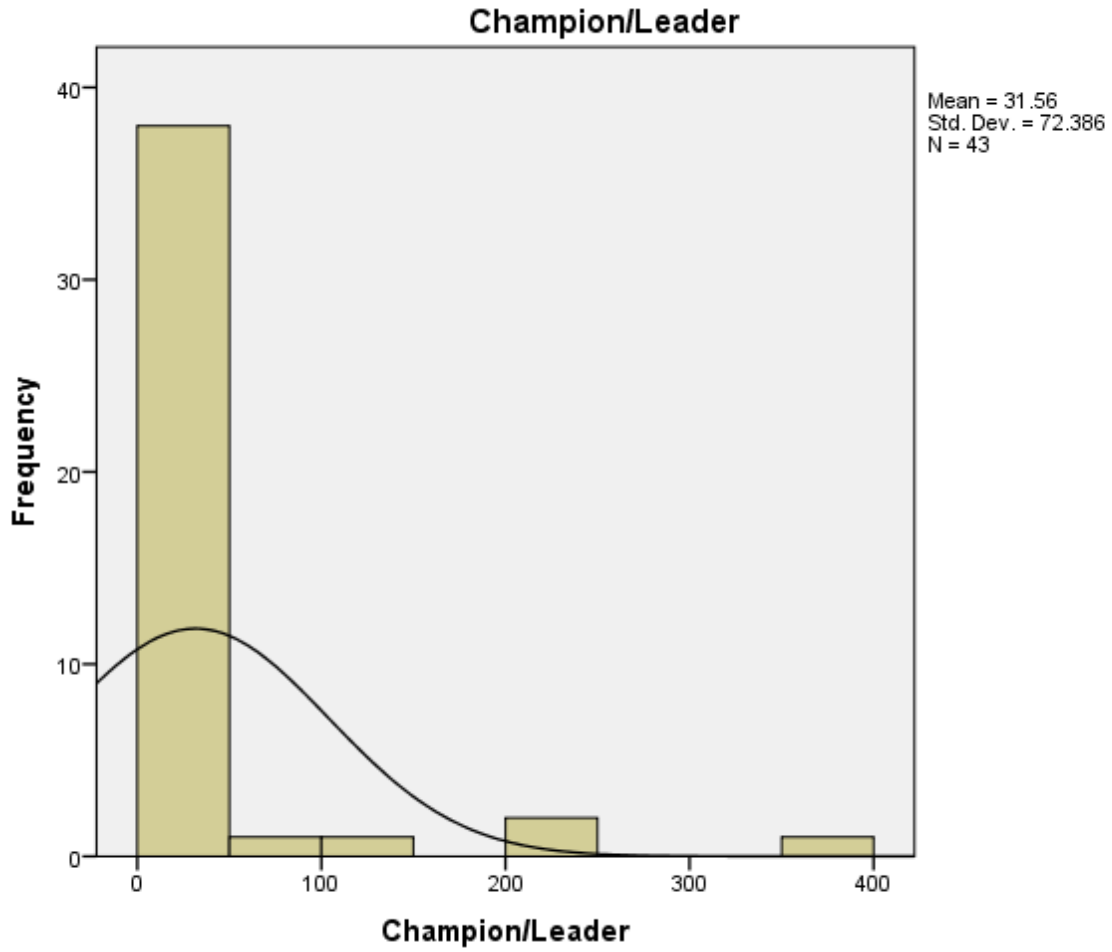

Figure 11. Thirty-five out of 43 Articles Discuss Champion/Leader

Table 14 is the quantitative analysis of the dependent variable Six-Sigma with descriptions of the word count and the number of articles the word manager is found. As a dependent variable it was compared with the other variables for strength of use and application in the articles. Six-Sigma is process whose word content strength was compared to dependent and independent variables and determined to make a difference comparing the five leadership styles referencing the hypothesis statement.

Table 14

Quantitative Analysis of Six Sigma

Frequency		No. of Articles	Percent	Valid Percent	Cumulative Percent
Valid	0	13	30.2	30.2	30.2
	1	1	2.3	2.3	32.6
	3	1	2.3	2.3	34.9
	4	1	2.3	2.3	37.2
	6	2	4.7	4.7	41.9
	8	1	2.3	2.3	44.2
	9	1	2.3	2.3	46.5
	10	1	2.3	2.3	48.8
	12	1	2.3	2.3	51.2
	13	1	2.3	2.3	53.5
	18	1	2.3	2.3	55.8
	33	1	2.3	2.3	58.1
	34	2	4.7	4.7	62.8
	48	1	2.3	2.3	65.1
	56	1	2.3	2.3	67.4
	60	1	2.3	2.3	69.8
	82	1	2.3	2.3	72.1
	94	1	2.3	2.3	74.4
	96	1	2.3	2.3	76.7
	119	1	2.3	2.3	79.1
	126	1	2.3	2.3	81.4
	127	1	2.3	2.3	83.7
	134	1	2.3	2.3	86.0
	201	1	2.3	2.3	88.4
	238	1	2.3	2.3	90.7
	250	1	2.3	2.3	93.0
	294	1	2.3	2.3	95.3
	325	1	2.3	2.3	97.7
	479	1	2.3	2.3	100.0
	Total	43	100.0	100.0	

The Six-Sigma variable has a word count of 2920. The highest five article counts are 479, 325, 294, 250, and 238 at 54% of the total word count.

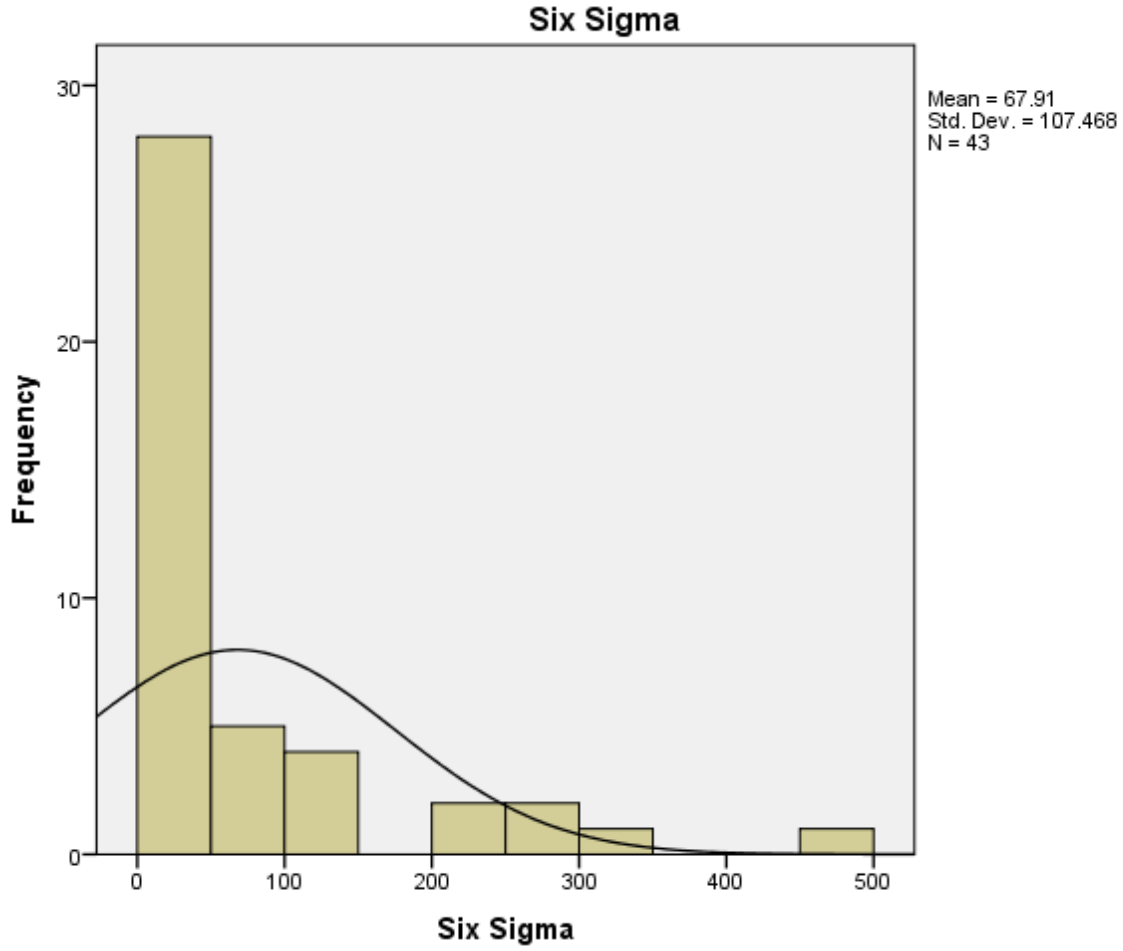

Figure 12. Thirty out of 43 Articles Discuss Six-Sigma

Table 15 is the quantitative analysis of the dependent variable subordinate with descriptions of the word count and the number of articles the word subordinate is found. As a dependent variable it was compared with the other variables for strength of use and application in the articles. Subordinate is an employee whose word content strength was compared to dependent and independent variables and determined to make a difference comparing the five leadership styles referencing the hypothesis statement.

Table 15

Quantitative Analysis of the Dependent Variable Subordinate/Employee

Frequency		No. of Articles	Percent	Valid Percent	Cumulative Percent
	0	3	7.0	7.0	7.0
	1	1	2.3	2.3	9.3
	2	1	2.3	2.3	11.6
	3	1	2.3	2.3	14.0
	4	2	4.7	4.7	18.6
	5	1	2.3	2.3	20.9
	6	5	11.6	11.6	32.6
	7	1	2.3	2.3	34.9
	8	3	7.0	7.0	41.9
	9	3	7.0	7.0	48.8
	11	1	2.3	2.3	51.2
	12	3	7.0	7.0	58.1
	13	1	2.3	2.3	60.5
Valid	15	2	4.7	4.7	65.1
	18	1	2.3	2.3	67.4
	19	2	4.7	4.7	72.1
	23	1	2.3	2.3	74.4
	28	1	2.3	2.3	76.7
	31	1	2.3	2.3	79.1
	34	1	2.3	2.3	81.4
	36	2	4.7	4.7	86.0
	40	1	2.3	2.3	88.4
	53	2	4.7	4.7	93.0
	54	1	2.3	2.3	95.3
	90	1	2.3	2.3	97.7
	103	1	2.3	2.3	100.0
	Total	43	100.0	100.0	

The subordinate/employee variable has a word count of 834. The highest four article counts are 103, 90, 54, and 53 at 35% of the total word count.

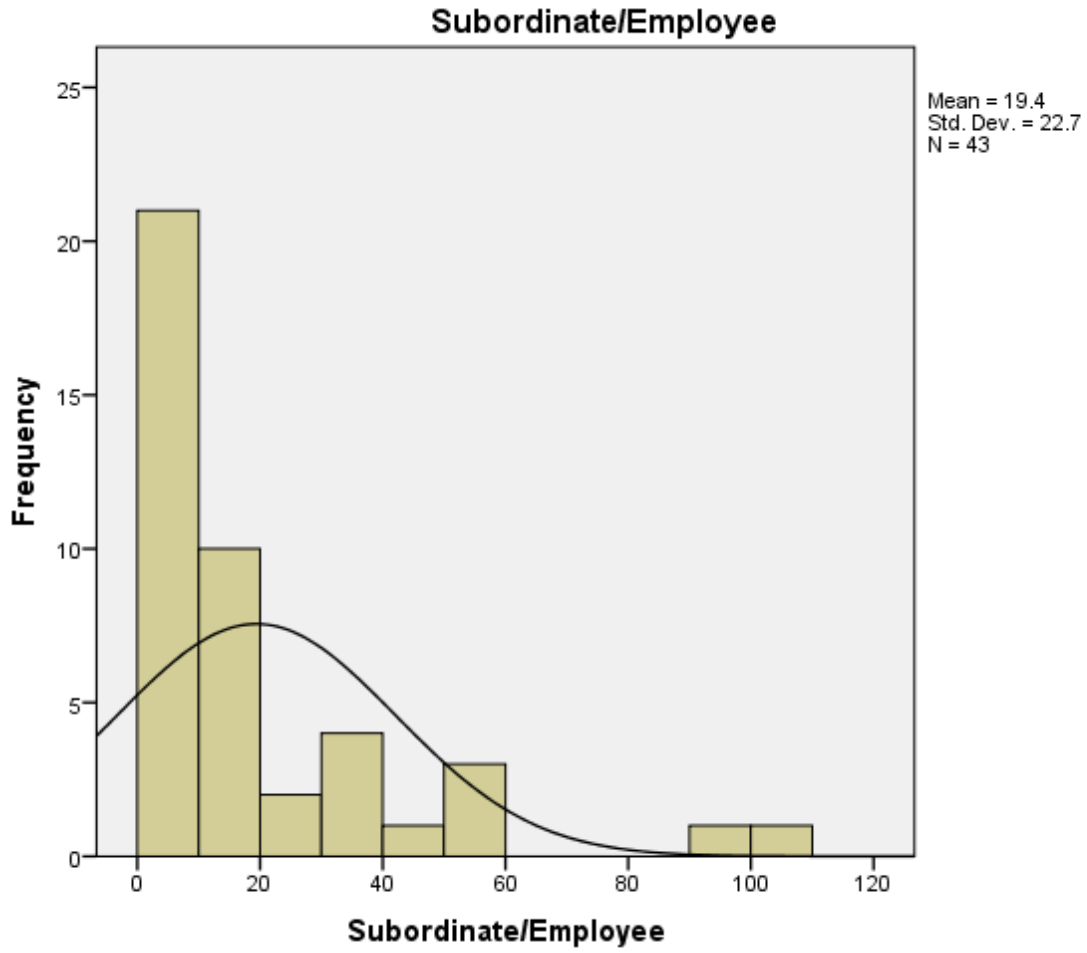

Figure 13. Forty out of 43 Articles Discuss Employees

The average percentage on the highest four articles word number count with 43 articles is 44%. This percentage shows the even spread of knowledge between the 43 articles on the variable of interest. The information was not limited to a few articles in the number count but spread evenly with strong correlations to the strongest leadership styles.

Table 16
Pressure/Force: Descriptive Statistics

	Mean	Std. Deviation	N
Pressure/Force	4.77	6.465	43
Black Belt	4.53	7.082	43
Leadership	31.40	48.217	43
Manager	15.30	19.246	43
Projects	11.72	17.572	43
Champion/Leader	31.56	72.386	43
Six Sigma	67.91	107.468	43
Subordinate/ Employee	19.40	22.700	43

Table 17
Pressure/Force Independent Variable and Dependent Variables

		Pressure/ Force	Black Belt	Leadership	Manager
Pressure/Force	Pearson Correlation	1	-.253	.264	.573**
	Sig. (2-tailed)		.102	.087	.000
	N	43	43	43	43
Black Belt	Pearson Correlation	-.253	1	-.277	-.119
	Sig. (2-tailed)	.102		.072	.445
	N	43	43	43	43
Leadership	Pearson Correlation	.264	-.277	1	.321*
	Sig. (2-tailed)	.087	.072		.036
	N	43	43	43	43
Manager	Pearson Correlation	.573**	-.119	.321*	1
	Sig. (2-tailed)	.000	.445	.036	
	N	43	43	43	43
Projects	Pearson Correlation	-.194	.456**	-.216	-.137
	Sig. (2-tailed)	.212	.002	.164	.380
	N	43	43	43	43

Champion/Leader	Pearson Correlation	.107	-.167	.688**	.144
	Sig. (2-tailed)	.493	.285	.000	.357
	N	43	43	43	43
Six Sigma	Pearson Correlation	-.266	.673**	-.305*	-.262
	Sig. (2-tailed)	.084	.000	.047	.089
	N	43	43	43	43
Subordinate/Employee	Pearson Correlation	.110	.267	-.044	.180
	Sig. (2-tailed)	.484	.083	.781	.249
	N	43	43	43	43

Pressure/Force, as an Independent variable, has positive statistically significant correlation with the variable Manager (r=0.573, p=0.000; it has a moderately strong statistically significant positive correlation with the variable Black-Belt (r=.456 and p=0.002) and a strong positive statistically significant correlation with the variable Six-Sigma (r=0.538, p=0.000).

Table 17
Pressure/Force Correlations (cont.)

		Projects	Champion/ Leader	Six Sigma	Subordinate Employee
Pressure/Force	Pearson Correlation	-.194	.107	-.266	.110**
	Sig. (2-tailed)	.212	.493	.084	.484
	N	43	43	43	43
Black Belt	Pearson Correlation	.456	-.167	.673	.267
	Sig. (2-tailed)	.002	.285	.000	.083
	N	43	43	43	43
Leadership	Pearson Correlation	-.216	.688	-.305	-.044*
	Sig. (2-tailed)	.164	.000	.047	.781
	N	43	43	43	43
Manager	Pearson Correlation	-.137**	.144	-.262*	.180

	Sig. (2-tailed)	.380	.357	.089	.249
	N	43	43	43	43
Projects	Pearson Correlation	1	-.093**	.538	.039
	Sig. (2-tailed)		.553	.000	.803
	N	43	43	43	43
Champion/Leader	Pearson Correlation	-.093	1	-.185**	.162
	Sig. (2-tailed)	.553		.234	.298
	N	43	43	43	43
Six Sigma	Pearson Correlation	.538	-.185**	1*	.034
	Sig. (2-tailed)	.000	.234		.828
	N	43	43	43	43
Subordinate Employee	Pearson Correlation	.039	.162	.034	1
	Sig. (2-tailed)	.803	.298	.828	
	N	43	43	43	43

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

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

Table 18

Consultation: Descriptive Statistics

	Mean	Std. Deviation	N
Consultation/ Conference	2.35	2.759	43
Black Belt	4.53	7.082	43
Leadership	31.40	48.217	43
Manager	15.30	19.246	43
Projects	11.72	17.572	43
Champion/Leader	31.56	72.386	43
Six Sigma	67.91	107.468	43
Subordinate/Employee	19.40	22.700	43

Table 19

Consultation Independent Variable and Dependent Variables

		Consultation/ Conference	Black Belt	Leadership	Manager
Consultation/ Conference	Pearson Correlation	1	-.055	.124	.290
	Sig. (2-tailed)		.727	.428	.059
	N	43	43	43	43
Black Belt	Pearson Correlation	-.055	1	-.277	-.119
	Sig. (2-tailed)	.727		.072	.445
	N	43	43	43	43
Leadership	Pearson Correlation	.124	-.277	1	.321*
	Sig. (2-tailed)	.428	.072		.036
	N	43	43	43	43
Manager	Pearson Correlation	.290	-.119	.321*	1
	Sig. (2-tailed)	.059	.445	.036	
	N	43	43	43	43
Projects	Pearson Correlation	-.159	.456**	-.216	-.137
	Sig. (2-tailed)	.310	.002	.164	.380
	N	43	43	43	43
Champion/Leader	Pearson Correlation	.081	-.167	.688**	.144
	Sig. (2-tailed)	.608	.285	.000	.357
	N	43	43	43	43
Six Sigma	Pearson Correlation	.008	.673**	-.305*	-.262
	Sig. (2-tailed)	.959	.000	.047	.089
	N	43	43	43	43
Subordinate/Employee	Pearson Correlation	-.120	.267	-.044	.180
	Sig. (2-tailed)	.443	.083	.781	.249
	N	43	43	43	43

Table 19 (cont.)

		Projects	Champion/ Leader	Six Sigma	Subordinate/ Employee
Consultation/Conference	Pearson Correlation	-.159	.081	.008	-.120
	Sig. (2-tailed)	.310	.608	.959	.443
	N	43	43	43	43
Black Belt	Pearson Correlation	.456	-.167	.673	.267
	Sig. (2-tailed)	.002	.285	.000	.083
	N	43	43	43	43
Leadership	Pearson Correlation	-.216	.688	-.305	-.044*
	Sig. (2-tailed)	.164	.000	.047	.781
	N	43	43	43	43
Manager	Pearson Correlation	-.137	.144	-.262*	.180
	Sig. (2-tailed)	.380	.357	.089	.249
	N	43	43	43	43
Projects	Pearson Correlation	1	-.093**	.538	.039
	Sig. (2-tailed)		.553	.000	.803
	N	43	43	43	43
Champion/Leader	Pearson Correlation	-.093	1	-.185**	.162
	Sig. (2-tailed)	.553		.234	.298
	N	43	43	43	43
Six Sigma	Pearson Correlation	.538	-.185**	1*	.034
	Sig. (2-tailed)	.000	.234		.828
	N	43	43	43	43
Subordinate/Employee	Pearson Correlation	.039	.162	.034	1
	Sig. (2-tailed)	.803	.298	.828	
	N	43	43	43	43

Consultation is the independent variable. The dependent variable black belt has a moderately strong statistically significant positive correlation with the variable Projects (r=0.456, p=0.002), and strong statistically significant positive correlation with the variable Six Sigma (r=0.673, p=0.000); dependent variable Leadership has a weak positive statistically significant correlation with the dependent variable Manager (r=0.321, p=0.002, strong with dependent variable Champion Leader (r=0.688,p=0.000), and negative weak statistically significant correlation between dependent variables Leadership and Six sigma (r=-0.305, p=0.044).

Table 20

Persuasion: Descriptive Statistics

	Mean	Std. Deviation	N
Persuasion/Influence	14.14	33.043	43
Black Belt	4.53	7.082	43
Leadership	31.40	48.217	43
Manager	15.30	19.246	43
Projects	11.72	17.572	43
Champion/Leader	31.56	72.386	43
Six Sigma	67.91	107.468	43
Subordinate/ Employee	19.40	22.700	43

Table 21

Persuasion Independent Variable and Dependent Variables

		Persuasion/ Influence	Black Belt	Leadership	Manager
Persuasion/Influence	Pearson Correlation	1	-.240	.498**	.409**
	Sig. (2-tailed)		.121	.001	.006
	N	43	43	43	43
Black Belt	Pearson Correlation	-.240	1	-.277	-.119
	Sig. (2-tailed)	.121		.072	.445
	N	43	43	43	43

Leadership	Pearson Correlation	.498**	-.277	1	.321*
	Sig. (2-tailed)	.001	.072		.036
	N	43	43	43	43
Manager	Pearson Correlation	.409**	-.119	.321*	1
	Sig. (2-tailed)	.006	.445	.036	
	N	43	43	43	43
Projects	Pearson Correlation	-.195	.456**	-.216	-.137
	Sig. (2-tailed)	.209	.002	.164	.380
	N	43	43	43	43
Champion/Leader	Pearson Correlation	.358*	-.167	.688**	.144
	Sig. (2-tailed)	.018	.285	.000	.357
	N	43	43	43	43
Six Sigma	Pearson Correlation	-.240	.673**	-.305*	-.262
	Sig. (2-tailed)	.122	.000	.047	.089
	N	43	43	43	43
Subordinate/ Employee	Pearson Correlation	-.041	.267	-.044	.180
	Sig. (2-tailed)	.793	.083	.781	.249
	N	43	43	43	43

Table 21 (cont.)

		Projects	Champion /Leader	Six Sigma	Subordinate/ Employee
Persuasion/Influence	Pearson Correlation	-.195	.358	-.240**	-.041**
	Sig. (2-tailed)	.209	.018	.122	.793
	N	43	43	43	43
Black Belt	Pearson Correlation	.456	-.167	.673	.267
	Sig. (2-tailed)	.002	.285	.000	.083
	N	43	43	43	43
Leadership	Pearson Correlation	-.216**	.688	-.305	-.044*
	Sig. (2-tailed)	.164	.000	.047	.781
	N	43	43	43	43

Manager	Pearson Correlation	-.137**	.144	-.262*	.180
	Sig. (2-tailed)	.380	.357	.089	.249
	N	43	43	43	43
Projects	Pearson Correlation	1	-.093**	.538	.039
	Sig. (2-tailed)		.553	.000	.803
	N	43	43	43	43
Champion/Leader	Pearson Correlation	-.093*	1	-.185**	.162
	Sig. (2-tailed)	.553		.234	.298
	N	43	43	43	43
Six Sigma	Pearson Correlation	.538	-.185**	1*	.034
	Sig. (2-tailed)	.000	.234		.828
	N	43	43	43	43
Subordinate/ Employee	Pearson Correlation	.039	.162	.034	1
	Sig. (2-tailed)	.803	.298	.828	
	N	43	43	43	43

Persuasion is the independent variable. The dependent variable Leadership has a moderately strong statistically significant positive correlation with the independent variable Persuasion (r=0.498, p=0.002), and moderately strong statistically significant positive correlation with the variable Manager (r=0.409, p=0.006); dependent variable Black-Belt has a strong statistically significant correlation with the dependent variable Six-Sigma (r=0.688, p=0.000, dependent variable Projects strong with dependent variable Six-Sigma (r=0.538, p=0.000), and negative weak statistically significant correlation between dependent variables Champion\Leader and Six sigma (r=-0.305, p=0.047).

Table 22

Inspiration/Encourage: Descriptive Statistics

	Mean	Std. Deviation	N
Inspiration/Encourage	4.95	9.388	43
Black Belt	4.53	7.082	43
Leadership	31.40	48.217	43
Manager	15.30	19.246	43
Projects	11.72	17.572	43
Champion/Leader	31.56	72.386	43
Six Sigma	67.91	107.468	43
Subordinate/ Employee	19.40	22.700	43

Table 23

Inspiration: Independent Variable and Dependent Variables

		Inspiration/ Encourage	Black Belt	Leadership	Manager
Inspiration/ Encourage	Pearson Correlation	1	-.222	.571**	.612**
	Sig. (2-tailed)		.152	.000	.000
	N	43	43	43	43
Black Belt	Pearson Correlation	-.222	1	-.277	-.119
	Sig. (2-tailed)	.152		.072	.445
	N	43	43	43	43
Leadership	Pearson Correlation	.571**	-.277	1	.321*
	Sig. (2-tailed)	.000	.072		.036
	N	43	43	43	43
Manager	Pearson Correlation	.612**	-.119	.321*	1
	Sig. (2-tailed)	.000	.445	.036	
	N	43	43	43	43
Projects	Pearson Correlation	-.220	.456**	-.216	-.137
	Sig. (2-tailed)	.156	.002	.164	.380
	N	43	43	43	43

Champion/Leader	Pearson Correlation	.215	-.167	.688**	.144
	Sig. (2-tailed)	.165	.285	.000	.357
	N	43	43	43	43
Six Sigma	Pearson Correlation	-.254	.673**	-.305*	-.262
	Sig. (2-tailed)	.101	.000	.047	.089
	N	43	43	43	43
Subordinate/Employee	Pearson Correlation	.010	.267	-.044	.180
	Sig. (2-tailed)	.951	.083	.781	.249
	N	43	43	43	43

Table 23
Inspiration Correlations (cont.)

		Projects	Champion/ Leader	Six Sigma	Subordinate/ Employee
Inspiration/Encourage	Pearson Correlation	-.220	.215	-.254**	.010**
	Sig. (2-tailed)	.156	.165	.101	.951
	N	43	43	43	43
Black Belt	Pearson Correlation	.456	-.167	.673	.267
	Sig. (2-tailed)	.002	.285	.000	.083
	N	43	43	43	43
Leadership	Pearson Correlation	-.216**	.688	-.305	-.044*
	Sig. (2-tailed)	.164	.000	.047	.781
	N	43	43	43	43
Manager	Pearson Correlation	-.137**	.144	-.262*	.180
	Sig. (2-tailed)	.380	.357	.089	.249
	N	43	43	43	43
Projects	Pearson Correlation	1	-.093**	.538	.039
	Sig. (2-tailed)		.553	.000	.803
	N	43	43	43	43
Champion/Leader	Pearson Correlation	-.093	1	-.185**	.162

	Sig. (2-tailed)	.553		.234	.298
	N	43	43	43	43
Six Sigma	Pearson Correlation	.538	-.185**	1*	.034
	Sig. (2-tailed)	.000	.234		.828
	N	43	43	43	43
Subordinate/Employee	Pearson Correlation	.039	.162	.034	1
	Sig. (2-tailed)	.803	.298	.828	
	N	43	43	43	43

Inspiration is the independent variable. The dependent variable Leadership has a moderately strong statistically significant positive correlation with the independent variable Inspiration (r=0.571, p=0.002), and strong statistically significant positive correlation with the variable Manager (r=0.612, p=0.000); dependent variable Black-Belt has a strong statistically significant correlation with the dependent variable Six-Sigma (r=0.673, p=0.000, dependent variable Projects strong with dependent variable Six-Sigma (r=0.538, p = 0.000), and negative weak statistically significant correlation between dependent variables Leadership and Six sigma (r =-0.305, p = 0.047).

Table 24
Exchange: Descriptive Statistics

	Mean	Std. Deviation	N
Exchange/Transfer	1.91	3.511	43
Black Belt	4.53	7.082	43
Leadership	31.40	48.217	43
Manager	15.30	19.246	43
Projects	11.72	17.572	43
Champion/Leader	31.56	72.386	43
Six Sigma	67.91	107.468	43
Subordinate/ Employee	19.40	22.700	43

Table 25

Exchange/Transfer: Independent and Dependent Variables

		Exchange / Transfer	Black Belt	Leadership	Manager
Exchange/Transfer	Pearson Correlation	1	-.168	.358*	.616**
	Sig. (2-tailed)		.280	.018	.000
	N	43	43	43	43
Black Belt	Pearson Correlation	-.168	1	-.277	-.119
	Sig. (2-tailed)	.280		.072	.445
	N	43	43	43	43
Leadership	Pearson Correlation	.358*	-.277	1	.321*
	Sig. (2-tailed)	.018	.072		.036
	N	43	43	43	43
Manager	Pearson Correlation	.616**	-.119	.321*	1
	Sig. (2-tailed)	.000	.445	.036	
	N	43	43	43	43
Projects	Pearson Correlation	-.148	.456**	-.216	-.137
	Sig. (2-tailed)	.344	.002	.164	.380
	N	43	43	43	43
Champion/Leader	Pearson Correlation	.135	-.167	.688**	.144
	Sig. (2-tailed)	.389	.285	.000	.357
	N	43	43	43	43
Six Sigma	Pearson Correlation	-.223	.673**	-.305*	-.262
	Sig. (2-tailed)	.150	.000	.047	.089
	N	43	43	43	43
Subordinate/ Employee	Pearson Correlation	-.013	.267	-.044	.180
	Sig. (2-tailed)	.933	.083	.781	.249
	N	43	43	43	43

Table 25
Exchange Correlations (cont.)

		Projects	Champion/ Leader	Six Sigma	Subordinate/Employee
Exchange/Transfer	Pearson Correlation	-.148	.135	-.223*	-.013**
	Sig. (2-tailed)	.344	.389	.150	.933
	N	43	43	43	43
Black Belt	Pearson Correlation	.456	-.167	.673	.267
	Sig. (2-tailed)	.002	.285	.000	.083
	N	43	43	43	43
Leadership	Pearson Correlation	-.216*	.688	-.305	-.044*
	Sig. (2-tailed)	.164	.000	.047	.781
	N	43	43	43	43
Manager	Pearson Correlation	-.137**	.144	-.262*	.180
	Sig. (2-tailed)	.380	.357	.089	.249
	N	43	43	43	43
Projects	Pearson Correlation	1	-.093**	.538	.039
	Sig. (2-tailed)		.553	.000	.803
	N	43	43	43	43
Champion/Leader	Pearson Correlation	-.093	1	-.185**	.162
	Sig. (2-tailed)	.553		.234	.298
	N	43	43	43	43
Six Sigma	Pearson Correlation	.538	-.185**	1*	.034
	Sig. (2-tailed)	.000	.234		.828
	N	43	43	43	43
Subordinate/ Employee	Pearson Correlation	.039	.162	.034	1
	Sig. (2-tailed)	.803	.298	.828	
	N	43	43	43	43

Exchange is the independent variable. The dependent variable Leadership has a moderately weak statistically significant positive correlation with the independent variable Exchange (r=0.358, p=0.018), and strong statistically significant positive correlation with the variable Manager (r=0.616, p=0.000); dependent variable Black-Belt has a strong statistically significant correlation with the dependent variable Six-Sigma (r=0.673, p=0.000), dependent variable Projects strong with dependent variable Six-Sigma (r=0.538, p = 0.000), and strong statistically significant correlation between dependent variables Leadership and Champion (r =0.688, p = 0.000).

Summary

The statistical correlation is significantly strong with the independent variables Pressure, Persuasion, and Inspiration out of the five independent variables. The dependent variables Leadership, Manager, Black-Belt, and Six-Sigma had the strongest correlations with the three independent variables. The first hypothesis was tested using the descriptive statistics of content analysis on the 43 articles. The highest number count dependent variables were Six-Sigma, Champion, and Leadership. The highest independent variable number counts were Persuasion, Pressure, and Inspiration. The MANOVA showed that there are differences between the variables in leadership style strength supporting the hypothesis statement that there is a difference in management styles when implementing Six-Sigma. Tables 16 to 25 show the statistically significant differences. The second hypothesis was tested when the researcher compared the strength of the project dependent variable with each independent variable. The dependent variables Six-Sigma and Black-Belt had the strongest significant correlation of dependent variable projects consistent with each independent variable. The strong

relationship reflected a positive correlation and will deliver positive results in the ratio of completion between management styles. The application of Six-Sigma quality correlates to better financial performance and profit (Freiesleben, 2006). The results support the hypothesis theory that there is a difference between ratios of completions in management styles. The results of the phone interviews gave strong support for the independent variable inspiration the strongest supported leadership style. Persuasion was a close second and pressure was supported with 35% less emphasis than inspiration.

Interviewed Black-Belts argued that empowerment and transformational leadership should be considered as influential leadership styles. The exchange variable was poorly supported in the article content but was discussed to have strong collaborative support by the Black-Belts. The content analysis word count focused on independent variables pressure, persuasion, and inspiration having the highest word count. The MANOVA showed that of the five independent variables, consultation and exchange were not strong in correlation. The phone interviews answered the questions on the three independent variables with consensus support for inspiration as the strongest, persuasion a close second, and pressure third, with a wider margin of separation. The three leadership styles were considered important, by the Black and Green-belts, for leaders of any organization, to use in their daily engagement with subordinates.

CHAPTER FIVE: SUMMARY

Overview of the Chapters

The overview of Chapter One presents the relationship between Six-Sigma process improvement and leadership styles. The leadership skills of Black-Belts and Managers determine the success of process improvement change models. This dissertation investigated leadership styles and successful Six-Sigma implementation. Black-Belts and Management from the content analysis received a validated coding tool that measured the success of implementing process improvement. Content analysis with statistical methods analyzed the proposed hypothesis.

Chapter Two reviewed research on Six-Sigma, leadership, influence styles and change models. The historical perspective validated from Six-Sigma's origin that it was arguable to compare and contrast the effects of leadership styles in change management. The literature revealed that attention was given to Six-Sigma for demonstrated proof in the business trends of profit and the impact leadership plays along implementing tool usage. Over the last 30 years, researchers have tested the theories linking leadership styles with bridging the gap between leaders and subordinates, and developed training that promoted positive change management. The broad scale success of positive influence requires more testing for current state as the industrial, business, and manufacturing environment changes constantly with a new generation of leaders. Many books were written by Six-Sigma consultants and objective researchers are few in number. Continued research should show how leaders are coping today with growing a lean business in any work environment using the proven tools of Six-Sigma led by Black-Belts and supporting Champions.

Chapter Three explored the hypothesis proposed in this study on influence styles and Six-Sigma implementation success with leadership in organizations. The research design reflected recent information in organizations and showed the positive or negative success of Six-Sigma implementation. The relationship between leadership influence styles and Six-Sigma implementation produced predictive correlations on the impact of improper implementation of process improvements by certified Six-Sigma experts.

Chapter Four shows that from the hypothesis research question, how Six-Sigma improvement is affected by various leadership styles; there is a difference in management styles when implementing process improvement. The phone interview of Black and Green-belts, on the strongest variables of influence, reflects the current day success of the leadership skills. The completion of projects has a higher rate of success implementing these leadership styles. The null hypothesis is rejected with the verification of the variables being statistically significant at the .05 significance level of the MANOVA test. The strongest variables were pressure, persuasion, and inspiration from the content analysis. The MANOVA analysis showed these variables statistically significant with the hypothesis H1 in Tables 17, 21, and 23. The results revealed significant findings that there is a difference in management styles implementing Six-Sigma. Three of the five independent variables made a significant difference, and the dependent variables leadership, champion, and Six-Sigma were statistically significant rejecting the null hypothesis. The descriptive statistics analyze the 43 articles statistical mean of 9.49 positive vs. 1.56 negative and a total sum of 408 positive vs. 67 negative of the P1= positive, P2 = negative variables. Each article was rated positive or negative in the support of Six-Sigma. The 43 articles had a positive support of Six-Sigma.

Future Recommendations

Future recommendations are for studies to be done with all the leadership styles combined with a larger population of Master Black-Belts, Black-Belts, Green-Belts, and upper management champions of the projects. The Black-Belts and Green-Belts should be sampled from several business and operations organizations limiting the sample size to 20 per organization. The data collection method should be a survey covering the peer reviewed leadership styles. The new leadership styles requested to be researched is empowerment and transformational leadership. Content analysis can be a small part for specific variable gathering purposes covering current journal data on the top leadership styles from statistical analysis. The Black and Green Belts, along with Management, should compare and contrast the strong vs. weak researched leadership styles and let the data reveal the trend in leadership style variation, with economic change, in today's high technology revolution. It is known that Six-Sigma will not always work for a company but good leadership, keeping the human element in control of delivering the benefit, will increase the odds for a positive financial outcome.

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APPPENDICES

Appendix A

Change Models

Steps	Definitions
GE's Seven Step Model	
1. Leading Change	Authentic, committed leadership essential for success
2. Creating a Shared need	Compelling need for change appealing to stakeholders
3. Shaping a Vision	Leadership must articulate clear vision of the world after change
4. Mobilizing the Commitment	Leadership support, compelling logic and clear vision
5. Making Change Last	Leverage early wins and gained knowledge for best practices
6. Monitoring Process	Monitor Progress and benchmark with celebrations
7. Changing Systems and Structures	Address underlying systems for continuous change (HR, Finance, IT systems etc.)
Kotter's Eight Step Model	
1. Increase Urgency	Examine market and competitive realities
2. Build the Guiding Team	Assemble a group with power to lead change
3. Get the Vision Right	Create a vision to help direct the change effort

4. Communicate for Buy-in	Use every vehicle possible to communicate the new vision
5. Empowering Action	Remove obstacles to the change
6. Create short term wins	Plan for and achieve performance improvements
7. Do not let up	Plan for and create performance improvements
8. Make Change Stick	Show connection between new behavior and corporate success

Jicks 10 step Model

1. Analyze the Organization and its need for change
2. Create vision and common direction
3. Create a sense of urgency
4. Separate from the past
5. Support a strong leadership role
6. Line up political sponsorship
7. Craft an implementation plan
8. Develop enabling structures
9. Communicate, involve people and be honest
10. Reinforce and institutionalize the change

Appendix B

Leadership Tactics and Behavior

Tactic	Behavior
Persuasion	Logical arguments to persuade others on a proposal
Inspiration	Emotional request that arouses enthusiasm through appeals
Consultation	Aspire participation in decision making on a policy or change
Pressure	Demands, threats, or intimidation used to convince others
Exchange	Promise rewards for corporation with a request

Appendix C

Research Techniques

Purpose	Types of Comparisons	Questions	Research Problem
Describe characteristics of Leadership styles	Message source A 1. Variable X across time 2. Variable X across situations	What?	To describe trends in Styles
Make inferences as to the antecedents Of leadership styles	Messages/non symbolic 1. Direct 2. Indirect	How?	Analyze techniques in Styles
Make inferences as to the effects of Leadership styles	Sender Messages/recipient	With what effect?	Measure influence Measure effect of influence styles

Source: Researched Articles from Journals

Appendix D

Content Analysis Code Sheet

Coder Name _____

Date Coded _____

Date of Article _____

Number of Mentions:	#	Positive	Negative
V1 Pressure	_____	_____	_____
V2 Consultation	_____	_____	_____
V3 Persuasion	_____	_____	_____
V4 Inspiration	_____	_____	_____
V5 Exchange	_____	_____	_____
V6 Black-belt	_____	_____	_____
V7 Leadership	_____	_____	_____
V8 Manager	_____	_____	_____
V9 Projects	_____	_____	_____
V10 Champion	_____	_____	_____
V11 Six-Sigma	_____	_____	_____
V12 Subordinate/employee	_____	_____	_____

- Theme 1 - Leadership in support of Black-Belts
- Theme 2 - Subordinates or employees in support of Six-Sigma
- Theme 3 - Projects started
- Theme 4 - Projects finished
- Theme 5 - Management Styles are effective

Appendix E

Data Collection Description: Code Book

Descriptors and Measurements of Leadership Styles

Summary:

The purpose of this content analysis research study utilizes the self-assessment of influence tactics and Six-Sigma tools with statistical analysis. The dependent variable is the success of process improvement and cost reduction. The independent variables are (a) pressure, (b) consultation, (c) persuasion, (d) inspiration, (e) exchange by Yukl and Falbe (1990). The content analysis will aim to investigate the preferred influence styles of leaders implementing Six-Sigma, and which style has more influence on the success of Six-Sigma.

Extent of collection: 1 data file Excel

Documentation (text)

Extent of processing: blanks/ alpha / numeric

Data format: Logical Record Length Excel

Part 1:	Part 2:
File Structure: rectangular	File Structure: rectangular
Cases: 1	Case: 1
Variables: 12	Variables: 12
Record Length: 30	Record Length: 30
Records per Case: 43	Records per Case: 43

Code Book (Cont.)

Part 3:	Part 4:
File Structure: rectangular	File Structure: rectangular
Cases: 1	Cases: 1
Variables: 12	Variables: 12
Record Length: 30	Record Length: 30
Records per Case: 43	Records Per Case: 43

Codebook for Leadership Styles (PI) Process Improvement

SPSS variable name and position	Variable	Values or Explanation
1. V1	Pressure	Pressure tactics should have an impact on individuals low in agreeableness reflect less importance on being liked and acting soft hearted.
2. V2	Consultation	seeks participation in strategic planning for change acceptance tactics.
3. V3	Persuasion	uses logical arguments and evidence to convince a subordinate of doing projects with success.
4. V4	Inspiration	appeals to values and ideals while the leader stimulates enthusiasm in the subordinate.

Code Book (cont.)

5.	V5	Exchange	supports promises that include favors resulting in a future shared subordinate benefit.
6.	V6	Blackbelt	experts performing statistical analysis for process improvement (PI) and a full time team leader in Six-Sigma tool usage.
7.	V7	Leadership	represents all leadership within an organization, and the unified momentum is viewed for the support or lack of support in (PI).
8.	V8	Manager	views mid-level managements position working with Black-Belts leading (PI)
9.	V9	Projects	projects led by the leadership of the organization arguing their influence style impact as strong or weak supporting (PI).
10.	V10	Champion	views upper management's support of Black-Belts on projects. Black-Belts have champions for each project.
11.	V11	Six-Sigma	Six-Sigma is continuous process

		improvement using specific improvement tools led by Green, Black, or Master Black-Belt who are experts in the tool usage and leading (PI) projects.
12. V12	Subordinate/Emp.	the employee's response to leadership styles and which one has the highest influence impact.

Theme 1 - Executive management in support of Black-Belts

Theme 2 - Subordinates or employees in support of Six-Sigma led by Black-Belts

Theme 3 - Projects started by Black-Belts

Theme 4 - Projects finished by Black-Belts

Theme 5 - Management Styles are effective with positive influence

1. (1) is used to represent yes and show support for the theme in the article
2. (2) is used to represent no and show the article did not support the theme

Positive/Negative View - Each article projects a positive or negative review regarding each

Variable

1. Total count of positive or negative views per article
2. Numeric "1", "2 " or "3" per variable per article

   (1) Signifies yes the article was neutral to the variable
   (2) Signifies no the article was positive to the variable
   (3) Signifies the article gave negative and negative views to the variable

Appendix F

Black-Belt Interview Questions

Mixed method quantitative analysis on the strongest variables of leadership style influence

Pressure

1. Tell me a time of pressure influence at work on a project and how you were affected.
2. Describe a time you needed to use pressure to motivate movement in a project.
3. Do you see yourself a constant user of pressure to get projects done, and how do you use this tactic.

Persuasion

4. Tell me of a time using persuasion from leadership to promote six-sigma tools?
5. Was this typical in some participants or for everyone and why?
6. Do you consider yourself persuasive and if yes where and when do you use this tactic in leading process improvement?

Inspiration

7. Do you consider yourself inspirational and when and what impact do you have?
8. What does being inspirational mean to you?
9. What do you benefit out of being inspirational and was there a time it didn't work, and why?
10. Can you tell me a time inspiration had less effect leading six-sigma?

Which of these three leadership styles are you strongest to influence your team using the Six-Sigma tools and how can this help company leaders' focus on implementing projects driving positive employee participation?

Appendix G

Consent Form Recorded Interview

Dear Prospective Participant:

My name is William Downes and I am a doctoral student in the Business department at Argosy University-Chicago working on my dissertation. This study is a requirement to fulfill my degree and will not be used for decision-making by any organization. This study is for research purposes only.
You are cordially invited to volunteer your participation in my CRP/thesis/dissertation research. The purpose of this research is to examine content analysis data.

What Will Be Involved If You Participate?
Your participation in this study is completely voluntary. If you participate in this research, you will be asked to participate in the following:
10 questions asked on your opinion using Pressure, Persuasion, and Inspiration as a Black-Belt in the workplace past or present.

How Long Will This Study Take?
The research will be conducted for 1 hour or less. You will be asked to participate during this timeframe.

What If You Change Your Mind About Participating?
You can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Your decision about whether to participate or to discontinue participating will not jeopardize your future relations with Argosy University-Chicago. You can do so without fear of penalty or negative consequences of any kind.

How Will Your Information Be Treated?
The information you provide for this research will be treated confidentially, and all data (written and recorded) will be kept securely. Written documentations will be stored in a locked file cabinet, accessible only by me, in my home. Recorded data and transcribed data will be stored on my personal password protected laptop, which accessible only by me, then transferred to the locked cabinet after the research is completed. Results of the research will be reported as summary data only, and no individually identifiable information will be presented. In the event your information is quoted in the written results, I will use pseudonyms or codes to maintain your confidentiality.

All information obtained will be held with the strictest confidentiality. You will be asked to refrain from placing your name or any other identifying information on any research form or protocols to further ensure confidentiality is maintained at all times. All recorded information will be stored securely for three years, as per Argosy University-Chicago requirements. At the end of the three years, all recorded data and other information will be deleted and all written data will be shredded.

What Are the Benefits in This Study?

There will be no direct or immediate personal benefits from your participation in this research, except for the contribution to the study. For the professional audience, the potential benefit of this research will provide additional knowledge to the literature on Leadership Styles Influence.

You also have the right to review the results of the research if you wish to do so. A copy of the results may be obtained by contacting William Downes at:
Email: William.Downes@sbcglobal.net or Phone: 239-443-7602

Additionally, should you have specific concerns or questions, you may contact my dissertation chair, Dr. Deborah Shearer at Argosy University-Chicago, by phone at 1-866-427-4679 ext. 41063 or email at dshearer@argosy.edu, or IRB Chair, Calvin Berkey, 1-941-724-5050, email cberkey@Argosy.edu, Argosy University-Chicago, 2233 West Dunlap Avenue, Phoenix, AZ 85021

I have read and understand the information explaining the purpose of this research and my rights and responsibilities as a participant. My signature below designates my consent to voluntarily participate in this research, according to the terms and conditions outlined above.
Participant's Signature: _____Date:
Print Name:

(The participant should retain one of the two copies of the consent letter provided by the principal investigator.)

Appendix H

Additional Figure

Figure 14 Analysis Flow