CONTENT ANALYSIS OF TRANSFORMATIONAL LEADERSHIP COMPETENCIES FOR VIRTUAL TEAMS

by

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Abstract

The quantitative content analysis compared virtual team leadership styles as described in peer-reviewed journal literature from 2005 to 2010 through the lens of two online education textbooks, *Transformational and Charismatic Leadership: The Road Ahead* (Avolio & Yammarino, 2002) and *The Transformational Leader: The Key to Global Competitiveness* (Tichy & DeVanna, 1990), which outline transformational leadership competencies. Bean's (2008) observation regarding the lack of alignment between textbooks and literature are explored. Based upon two alternative hypothesis the content of the two textbooks and the literature showed significant differences, thus agreeing with Bean (2008). Research on virtual learning and virtual teamwork in the past century focused on acceptance and normalization. Online team meetings are an important aspect of industry and education; more than 13 million workers are involved in virtual project teams (Arnold, 2008). According to various literature authors, virtual team leadership might be a natural extension of the transformational leadership model. The four concepts, *flexibility, interdependent, responsiveness,* and *identification* are essential skills for effective virtual team leadership and noted in the textbooks on transformational leadership. The study used Catpac II™ software to code textbooks and peer-reviewed journal literature for comparison of textbooks to literature. Implications for training and practice are discussed. Transformational leadership competencies are outlined using the Five Factor model (Antonakis & House, 2002).

Dedication

I wish to dedicate this dissertation to my deceased father, Argil, who served his country as a soldier, served his family with his life, and taught me the value of always being a gentleman. His commitment to life-long learning was manifested by his success at learning to read very late in his life, an inspiration to me to complete a doctorate late in my life.

Acknowledgments

Thank you to my family, friends, and church for allowing me the years needed to complete a doctorate. Without their sacrifice, I would not have been able to pursue this dream. I wish to thank Chester Pepper for his awe and respect for the doctoral process; always he was a reminder of what an amazing opportunity a terminal degree represents. At the beginning of this journey a colleague cautioned me to keep my focus narrow; no truer words describe the process.

Given my tenacious and independent learning style, my chair, Dr. Cheryl Cox and committee, Drs. Cheri Halderman and Carol Woehler, showed amazing patience. I am ever grateful to them for allowing time, the tool needed to juggle family and work with scholarship.

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CHAPTER 1

INTRODUCTION

The quantitative content analysis compares twenty-first century virtual team leadership as described in peer-reviewed journal literature from 2005 to 2010 through the lens of two online education textbooks, *Transformational and Charismatic Leadership: The Road Ahead* (Avolio & Yammarino, 2002) and *The Transformational Leader: The Key to Global Competitiveness* (Tichy & DeVanna, 1990). Transformational leadership competencies are outlined using the Five Factor model (Antonakis & House, 2002). Textbook content does not necessarily reflect best practices; instead, textbooks tend to reflect restatement of previous textbooks, thus perpetuating academia (Bean, 2008).

Teams are a normal activity for business communication and productivity (Nedelko, 2008). Online team meetings are an important aspect of industry and education (Arnold, 2008; Virolainen, 2011). Many people consider Bernard M. Bass and James M. Burns the foundational theorists of leadership and organizational studies for transformational leadership. Bass predicted in 1967 that in the early twenty-first century managers would be supervising across distance using computers (Avolio & Yammarino, 2002). Bass continued his predictions stating leaders would become more like social and behavioral specialists who assume the role of teachers (Avolio & Yammarino, 2002). In 2000, Bass reflected on his predictions that came true and proposed that during the next 30-plus years, "Leaders will be prized for their innovativeness, responsiveness and flexibility, all linked to their greater frequency of transformational leadership behavior" (Avolio & Yammarino, 2002, p. 382).

Virtual team activities are an expected component of University of Phoenix Online Learning System®. Hereafter, collaborative online distance learning will be known as eLearning for the purposes of the study (Monahan, McArdle, & Bertolotto, 2008). Asynchronous and synchronous virtual learning environments, unhampered by geographic location, provide both industry and student virtual teams the opportunity to collaborate on projects. E-Learning affords learners a place to exchange ideas independently of geographical location (Prasolova-Førland & Wyeld, 2008).

The content analysis study outlines the potential advantage of virtual team leadership by extending the work of Nunamaker, Reinig, and Briggs (2009) on satisfaction in virtual teams. Three outstanding satisfaction factors are the desire for order, communication, and trust within team projects (Foo, Sin, & Yiong, 2006; Furumo & Pearson, 2007; Nunamaker et al.). All three factors may best be served by the purposeful efforts of leaders aware of the uniqueness of virtual environments.

Background

The number of virtual teams is increasing (Sivunen, 2006). More than 13 million workers are involved in virtual project teams, some daily and some for singular activities (Arnold, 2008). Approximately two-thirds of Intel employees collaborate with team members across distance (Nunamaker et al., 2009). In the second decade of the twenty-first century business will rely upon virtual environments delivered through the Internet to accomplish their core activities. The work environment fundamentally has changed (Nicholson, Sarker, Sarker, & Valacich, 2007). "Virtual teams face new challenges that make them more difficult to manage than traditional face-to-face teams," (Nunamaker et al., p.1). Digital natives who dominate the work force expect work environments which

are rich in technology and leaders who understand this new culture. Collaborative virtual environments (CVEs) are relatively new when compared with the transformational leadership model. Available peer-reviewed journal literature and research on leadership is plentiful. The content analysis study compares the two disciplines of transformational leadership and leadership for CVEs. Previous research on teamwork skills focused on processes, specific software, and dedicated personnel (Beer, Slack, & Armitt, 2005; Nedelko, 2008; Nunamaker et al., 2009). Research on collaborative virtual environments has spikes of interest in this new millennium. The relatively recent phenomenon of the CVE suggests the need to expand knowledge combining virtual teamwork, leadership, and eLearning (Nunamaker et al.; Pearce, Clarke, & Gannaway, 2007). Virtual teamwork is an important and valuable component of education (Pearce et al., 2007). According to Liu, Magjuka, Bonk, and Lee (2007), 90% of community colleges have online courses. Educators recognize the value of expanding pedagogy or andragogy to include virtual representations of classrooms that can provide support for the traditional face-to-face (F2F) classroom (Berge, 2007; Carron, Marty, & Heraud, 2008; Johnson, 2005; Ligorio, Cesareni & Schwartz, 2008; Regenbrecht, Haller, Hauber & Billinghurst, 2006; Tutty & Klein, 2008).

Problem Statement

The problem is the ubiquitous textbook is accepted as a norm for imparting current wisdom (Bean, 2008). The value of the comparison textbooks (Avolio & Yammarino, 2002; Tichy & DeVanna, 1990) is assumed by the inclusion in doctoral level coursework on leadership. Each of the chosen textbooks offers homogeneous editorial content representing the views of many sources. Textbooks are a fundamental

resource for teaching and learning; as such, textbooks determine the content and methods for courses (Kajander & Lovric, 2009). Time pressures to adopt textbooks and author needs to create textbooks are threats to the accuracy of the content (Steuer & Ham, 2008). Textbooks institutionalize information but not necessarily current professional practice (Stambaugh & Trank, 2010). The sample textbooks pre-date learning and work environments dependent upon technology-mediated communication.

The sample textbooks (Avolio & Yammarino, 2002; Tichy & DeVanna, 1990) on transformational leadership were written prior to virtual environments that dominated the workplace and higher education. The textbooks propose a model of transformational leadership rich in F2F interaction. Body language, nuances of verbal communication and proximity define transformational leadership. A simple good morning greeting, an effective F2F tool of transformational leaders (Sergiovanni, 1982), lacks simplicity in asynchronous virtual environments. Transformational leaders are the dream makers who make sure everyone feels special. Followers under this leadership style perceive themselves to be less like subordinates and become partners in directing the organization. Relationships and perceptions become the driving forces for change. "Transformational leadership is about change, innovation, and entrepreneurship" (Tichy & DeVanna, 1990, p. 6). The skills, attitudes and behaviors of transformational leadership can be learned.

Peer-reviewed journal literature reflects best the practical application of knowledge, skills, and attitudes most likely produced by practitioners (Bean, 2008). According to Bean (2008), textbooks are written by academicians whose tendency is restating other texts. Leadership practitioners and students may use the outcomes from the study to apply transformational leadership to virtual teams.

Participants in teamwork express frustration when working on group assignments (Meister, 2000). Students or workers are grouped with the expectation to perform in a team with the expectation that prior skill exists to facilitate the process (Thomson, 2007). Team leaders need successful strategies for communication in virtual environments defined by text messaging, blogs, e-mail, and online social networks (Nicholson et al., 2007). Many leaders are proficient using F2F communication, but virtual environments present additional challenges for team projects (Krull & Murphy, 2006; Nicholson et al.). Guiding teams is a purposeful endeavor; the process is not intuitive (Liu, Magjuka, & Lee, 2008). Specific leadership skills can be taught (Bass, 2002). One underlying assumption of the content analysis study was a desire to have effective leadership and order within group performance (Foo et al., 2006).

The content analysis study compared peer-reviewed literature in the University of Phoenix Library with two leading textbooks on transformational leadership. Content analysis is the best process for comparing text material (Neuendorf, 2002). Meta-analysis studies exist on comparing virtual leadership styles (Kahai, Fjermestad, Zhang, & Avolio, 2007); none compared textbooks on transformational leadership with literature for alignment. The study used Catpac II™ and SPSS® software for a quantitative content analysis comparing the leadership competencies found in the literature and the sample textbooks.

Purpose Statement

The purpose of the quantitative content analysis study was comparing virtual team leadership as described in peer-reviewed journal literature with textbooks on transformational leadership. Content analysis provides structure for a purposeful analysis

with the rigor of statistical evaluation of text, such as textbooks and journal articles (Neuendorf, 2002; Samkin & Schneider, 2008). Content analysis is a methodology for evaluating information (Creswell, 2005; Neuman, 2003). Constructing a research model for content analysis requires coding textbooks and a representative sample of peer-reviewed journal articles from 2005 to 2010, the next step is comparing similarities or differences. "Content analysis is a technique for examining information, or content, in written or symbolic material" (Neuman, 2003, p. 36).

According to Neuendorf (2002), quantitative content analysis is the appropriate methodology for comparing textual content. Software tools, such as Catpac II™ is recommended by Neuendorf (2002) for facilitating the process of comparing text. Catpac II™ compares large amounts of text material without the need for user-created codebooks. Catpac II™ can be used to reveal themes independent of subjective codebooks. Using software, such as Catpac II™, minimizes the bias inherent in manual comparisons using traditional codebooks.

The independent variable is transformational leadership competencies as identified in two online education textbooks (see Appendix B). The dependent variable is virtual team leadership competencies from peer-reviewed journal literature. Confounding variables are synonyms for either transformational leadership competencies or virtual team leadership competencies. Technology assisted the analysis, specifically SPSS®, manipulated the hundreds of data words Catpac II™ revealed as independent and dependent variables. The uniqueness of Catpac II™ is the ability of the software to read similarly to human intelligence through the construction of neural networks and generate themes (Galileo, 2011).

The population for the content analysis was documents from EBSCOhost©, Gale PowerSearch©, and ProQuest© in the University of Phoenix Library published from 2005 to 2010 and two online education textbooks. The two textbooks, Avolio and Yammarino (2002) and Tichy and DeVanna (1990), outlined transformational leadership competencies. The textbooks are used in doctoral-level courses on leadership at the University of Phoenix. The University of Phoenix Library is a web-based aggregate accessing a variety of data-bases, stated otherwise, the library does not exist in traditional geographic space such as a traditional bricks and mortar establishment because it is online.

Significance of the Study

In today's digital society, leaders may need sophisticated communication skills marked by technology cleverness. Leaders need to know more regarding the needs of Generation Text (Bush, 2008) and the V-Gen (Proserpio & Gioia, 2007) to meet the affective demands of transformational leadership. Learning environments need to be challenging, stimulating, and satisfying to compete for the attention of digital natives (Prensky, 2006). Online forums are poised to take another leap as broadband technology expands opportunities for virtual collaboration to include streaming media (Colbert, 2005). The University of Phoenix PhoenixMobile 3.0 is one such example that promotes anytime, anywhere access to classes. Improving satisfaction and retention is important to maximizing the efforts of virtual team participants (Muilenburg & Berge, 2005; Piotrowski & Vodanovich, 2000).

Much knowledge exists concerning leadership skills and is growing in virtual environments, but the two disciplines rarely combine. Leadership practices marginally

successful in F2F become woefully inadequate in a virtual learning environment in which the participants are accessible only through the Internet (Chen, Wu, Yang, & Tsou, 2008; Zhang, 2008). The International Society for Technology Education recently released the standards administrators of education need to master (International Society for Technology Education, 2009). Top of the list of standards is the ability to understand an evolving digital culture as critical to leading staff and students. Past research on leadership training was developed before technology created a nation awash in digital environments. As recently as 2010, Shuffler, Wiese, Salas, and Burke (2010) noted that "significant gaps exist in our understanding, particularly in terms of virtual team leadership" (p. 3). Leaders desiring to leverage virtual environments may use the outcomes from the study in developing better policy decisions.

Significance to Leadership

According to Nunamaker et al. (2009), "Virtual teamwork is different than face-to-face teamwork in many ways so it takes overt and explicit effort to design new work processes to make it successful," (p. 4). V-Generation consists of the digital natives who have grown up immersed in robust technology, capable of multiplexing with extreme efficiency (Prensky, 2006; Proserpio & Gioia, 2007). Generation Text is more comfortable communicating through text-based forums than F2F (Ettkin, 2008). The V-Gen is immersed in simulations, virtual environments, online searching, and games (Proserpio & Gioia, 2007). Millennial are one of the newest demographics for labeling digital natives (Ng, Schweitzer, & Lyons, 2010).

More than 13 million workers are involved in virtual project teams (Arnold, 2008). Leaders in virtual environments may need specific skills for virtual teams to

innovate change (Brake, 2006). Learning and work teams are assigned a task with very little purposeful guidance, as an expectation exists that everyone knows how to accomplish teamwork effectively (Pearce et al., 2007). The reality, as noted in anecdotal comments, is the opposite (Muilenburg & Berge, 2005). Leadership and the desire for a leader in team projects is expressed in An et al. (2008) and Foo et al. (2006). Chen et al. (2008) looked at goals similar to the study by identifying the various leadership roles important for improving virtual team effectiveness, but they did not compare them to transformational leadership.

Upper management needs continual learning to lead rapidly changing virtual environments (Berge, 2007). More leaders are tasked with virtual followers, and the relationship between performance and leadership style is in question (Kark & Shamir, 2002; Walumbwa, Avolio & Zhu, 2008). Leaders may use the outcomes of the study to justify changes in process work flow decisions for the virtual environments they lead (Nunamaker et al., 2009).

Nature of the Study

Content analysis is a quantitative methodology (Creswell, 2005; Neuendorf, 2002). Quantitative methodologies use numbers, proportions, and statistics generated from a relationship of variables, whereas qualitative research explores phenomena, themes, and patterns (Creswell, 2005). Quantitative methods can predict possible outcomes (Creswell, 2005). Content analysis is a quantitative methodology that converts communication messages into manageable data (Neuendorf, 2002).

Content analysis compares latent and manifest terms in text for similarities and differences. The Catpac II™ software by Galileo (2011) determines concepts

objectively. Traditional content analysis uses a codebook (dictionary) subjectively built by researchers looking for concepts. Using a similar strategy to search engines, the University of Phoenix Library was queried using key terms identified in the preliminary literature review for virtual teamwork leadership.

The study explored approximately 800 pages of text, textbooks consist of 589 pages and the journal articles are 210 pages, using a combination of two pieces of software, SPSS® and Catpac II™. Evaluating 800 pages of text manually requires hundreds of hours looking for themes or concepts to guide leadership decisions. Researcher bias is inherent in a manual coding process, whereas Catpac II™ removes the human process of determining importance and reliability. Comparing textbooks to peer-reviewed literature using traditional methods with multiple human coders requires significant training and piloting to improve reliability.

Hypothesis and Research Questions

The purpose of the quantitative study was comparing virtual team leadership as described in peer-reviewed journal literature from 2005 to 2010 through the lens of two education textbooks outlining transformational leadership competencies. The independent variables are the competencies outlined in the sample textbooks (see Appendix B). The dependent variables are virtual team leadership concepts from peer-reviewed journal literature. Confounding variables are synonyms and latent terms either for transformational leadership competencies or for virtual team leadership concepts (see Appendix C).

The following research questions guided the process:

R1. What leadership model does peer-reviewed journal literature support when guiding virtual teams?

R2. How much alignment exists between the textbook and peer-reviewed journal literature for virtual team leadership?

In addition to the research questions, the following null and alternative hypothesis guided the analysis of the textbooks and literature:

$H_0$1: No significant difference exists between two online education textbooks and peer-reviewed journal literature (2005 to 2010) concerning leadership competencies when allowed free association to the term "leadership."

H_a1: Significant difference exists between two online education textbooks and peer-reviewed journal literature (2005 to 2010) concerning leadership competencies when allowed free association to the term "leadership."

$H_0$2: No significant difference exists between two online education textbooks and peer-reviewed journal literature (2005 to 2010) concerning leadership competencies when the analysis is defined by transformational leadership.

H_a2: Significant difference exists between two online education textbooks and peer-reviewed journal literature (2005 to 2010) concerning leadership competencies when the analysis is defined by transformational leadership.

$H_0$3: No significant difference exists between two online education textbooks and peer-reviewed journal literature (2005 to 2010) concerning leadership competencies when the analysis as defined by virtual team leadership competencies.

H_a3: Significant difference exists between two online education textbooks and peer-reviewed journal literature (2005 to 2010) concerning leadership competencies when the analysis as defined by virtual team leadership competencies.

Theoretical Framework

Leaders of virtual teams will need enhanced skills for leading from afar (Harney, 2005; Brake 2006). A positive presence of a distinct leader is essential to the success of the virtual team (An et al., 2008; Foo et al., 2006; Furumo, 2009). Contemporary challenges and issues are the matrix for comparing four leadership styles. Four leadership styles that dominate contemporary peer-reviewed literature are transformational, transactional, charismatic, and laissez-faire. Each style has evolved from a context of needs determined by the various stakeholders. Three of the four leadership styles resulted from Bass' theory of leadership in 1985 and later expanded to the Full-Range Leadership Theory (FRLT) with Avolio (Bass & Avolio, 1997).

Transactional leaders, administer through a system of exchange. This exchange process is based upon compliance (Yukl, 1998). Compliance is voluntary or coercive because followers want what the transactional leaders' organization will provide. Followers generally attain what they want, if the leader is successful. This leadership style is considered by many to be one level up from a manager in social importance and contemporary literature. The goals are wrapped around production; success is defined by task accomplishment. Clear hierarchies delineate relationships between leader and subordinates. However, leaders of this style can be depended upon to bring order from chaos (Schein, 2003). They can get things done, at times this is an essential style to move mountains and force change. Bernard M. Bass and James M. Burns are considered by

many people in leadership and organizational studies as the foundational theorists for what is now called transformational leadership. Burns considered transactional and transformational leadership styles to be opposite ends of a leadership continuum; Bass disagreed, he believed one was part of the other (Judge & Piccolo, 2004). Burns placed transactional leadership on a par with Machiavelli, stated otherwise someone who was manipulative and undesirable.

Charismatic leaders have great smiles. Kouzes and Posner (2003) suggest charismatic leaders are the result of the great man theory, in which people are born to such feelings of grandeur. Questions around the charismatic leader's ability to maximize the relationship to his or her followers surround such fringe topics as charismatic leaders are the result of a weak parental bond; conversely, transformational leaders result from strong parental bonds (Popper & Mayseless, 2002). Accepting such hypothesis confronts the tendency of some writers to claim charismatic leadership as a subset to transformational leadership. If childhood predetermines a leader's style, perhaps the motivation of a pure charismatic could be explained from a desire for admiration and adoration (Popper & Mayseless, 2002). Dangerous examples are Hitler, Stalin, and Jim Jones.

The Founding Fathers of the United States of America were deeply suspicious of charismatic leaders and developed the Electoral College to prevent a popular government from side-stepping the Constitution (Couto, 2002). Historical figures such as F.D. Roosevelt, J.F. Kennedy, and Winston Churchill are examples of benign charismatic leaders.

Laissez-faire. According to Burns (1978), laissez-faire is also a subset of transactional leadership, such parsing may be inconsistent to an understanding of transactional leadership but not completely divorced. Transactional is directive with active and passive management by exception principles employing various levels of scrutiny. Laissez-faire historically is synonymous with carefree, a light touch, likened unto the foundations of Jeffersonian government: minimalist.

Laissez-faire may also be considered the ultimate empowerment of followers, assuming an organization has been effectively trained. Because the maturity of the followers manifesting the ideal self-directed worker, this trust could be construed as a transactional process; they desire autonomy, and the leader desires freedom to focus on other needs. Great leaders recognize that *people* are the most valuable asset.

Transformational leaders say good morning to everyone they meet, they are very personable people (Sergiovanni, 1982). They are the dream makers who make sure everyone feels special. Followers under this leadership style become partners in directing the organization and less subordinate, or such is the perception. Perception and relationships become the ruling strategy for change. Transformational leaders would match the description of a Level Five Executive in Jim Collins' classic book on leadership titled, *Good to Great: Why Some Companies Make the Leap . . . and Others Don't*. "Level Five leaders channel their ego away from themselves and into the larger goal of building a great company" (Collins, 2001, p. 21). Transformational leaders are characterized by curiosity and openness (Popper & Mayseless, 2002). They exhibit patience and empathy and a clear vision that followers can emulate.

"The resemblance between transformational leaders and good parents is expressed in the following main aspects:

1. both are sensitive and responsive, showing individual consideration to their protégée
2. both reinforce the protégée's autonomy
3. in a supportive and non-judgmental way
4. and by actively providing opportunities, promoting relevant experiences, giving explanations, etc.
5. and both are positive examples to identify with and look up to" (Popper & Mayseless, 2002, p. 211).

Authors Kouzes and Posner (2003) have charted the exemplary leader in the text *Business Leadership*. Their summary on page 73, mirrors many authors regarding the five best practices common to a transformational leader:

1. Model the way.
2. Inspire a shared vision.
3. Challenge the process.
4. Enable others to act.
5. Encourage the heart.

One outcome of a study by Hambley, O'Neill, and Kline (2007) raised the question of which of four leadership styles is appropriate for leading virtual teams. The content analysis study assumed transformational leadership as an appropriate paradigm of leadership because during the 1990s, transformational leadership was the most researched

leadership model (Dumdum, Lowe, & Avolio, 2002; Parry, 2002). In multiple studies the validity of transformational leadership was documented (Bass, 1985; Parry, 2002).

Leaders desiring to leverage virtual environments might use the outcomes from the content analysis study in developing better policy decisions concerning work processes (Nunamaker et al., 2009). Chen et al. (2008) looked at similar goals as the content analysis study by identifying the various leadership roles important for virtual team leadership in the *Journal of Educational Technology & Society*. However, Chen et al. did not compare peer-previewed literature outcomes to popular textbooks.

Sample and Setting

Two textbooks commonly used in leadership training at the University of Phoenix are *Transformational and Charismatic Leadership: The Road Ahead* (Avolio & Yammarino, 2002) and *The Transformational Leader: The Key to Global Competitiveness* (Tichy & DeVanna, 1990). The peer-reviewed journal literature for comparison was accessed through the University of Phoenix Library, specifically the EBSCOHost©, Gale Power© and ProQuest© databases. The literature sample was limited to 2005 through 2010.

Definitions

- Codebook: a list of words for analysis (Neuendorf, 2002).
- Coding: a systematic procedure for objectively counting and locating words in text (Neuendorf, 2002; Neuman, 2003).
- KWIC: key words in context; words dependent upon surrounding text to have value. A word included in a phrase would count as a hit for latent frequency

counting and must contain all the terms in the correct order (Neuendorf, 2002).

- KWOC: key word out of context; the word or phrase has value standing alone (Neuendorf, 2002).
- Latent coding: concepts not directly countable without contextual clues, but implied through indicators. Latent content requires manifest variables (Neuendorf, 2002). Latent coding can be subjective.
- Literature: refers to peer-reviewed journal articles found in the University of Phoenix Library database.
- Manifest coding: counting written words physically present (Neuendorf, 2002). Frequency counting of words from a user created dictionary.
- Text: written words.
- Satisfaction is the perception of fulfillment of goals or the likelihood of attainment (Reinig, Briggs, & deVreede, 2009).
- Trust is the willingness of an individual to be vulnerable to the actions of another person (Furumo & Pearson, 2007).
- Virtual teaming: a group of people executing collaborative work processes facilitated by computer-mediated communication and independent of space and time boundaries (Ahanchian & McCormick, 2009).

Assumptions

Teams are successful when the members are interdependent; they provide a synergistic effort that surpasses combined individual efforts (Scarnati, 2001). More than half of managers work part of their jobs with virtual teams (Cordery & Soo, 2008). The

study assumption was students or staff will gain significantly greater satisfaction from the teamwork process through relevant leadership training and thus improve retention or lessen attrition because replacement of personnel is expensive. The hypothesis explores, which leadership model meets the needs of virtual teams. Few objective studies explore leading from afar (Avolio & Yammarino, 2002). Too many studies explore virtual leadership through laboratory environments; according to Kahai et al. (2007) more field studies and fewer lab situations are needed to study the needs of leading virtual teams.

For the purposes of the content analysis study, transformational leadership was used as an appropriate paradigm of leadership. During the 1990s, transformational leadership was the most researched leadership model (Dumdum et al., 2002; Parry, 2002). The usefulness and validity of transformational leadership was established in multiple studies (Bass, 1985; Parry, 2002). Building upon the belief in the proven usefulness is the assumption that transformational leaders can transform or change individuals and organizations (Antonakis & House, 2002).

The underlying assumption in the study is a desire to have leadership and order within group performance (An et al., 2008; Foo et al., 2006; Zhang, 2008). Many students in adult education express frustration with group assignments. The most common problems are lack of internal and external leadership and nonperformance or low performance by one or more members of the team (Furumo, 2009).

According to Bean (2008), reference to journals and practitioner terminology is limited in textbooks. According to Coppola, Hilz, and Rotter (2002), textbook writers have field experience, but few scholarly citations. Opposite this opinion is work by Marshak and DeGroot (1978) who claim textbook authors rely on literature review with

little field experience. The content analysis study explored these polar opinions for virtual team leadership.

Scope, Limitations, and Delimitations

The study was limited to two textbooks (Avolio & Yammarino, 2002; Tichy & DeVanna, 1990) used by the University of Phoenix for educational leadership training. For the study, only literature from the University of Phoenix Library was used to provide a representative sample of peer-reviewed journal literature available for a comparative analysis. The limitation was a reflection of the content generally used by University of Phoenix students of leadership.

Virtual teams are likely to be culturally very diverse (Sivunen, 2006). Culture, race, and religion are identified as delimiting factors outside the scope of the study. Substantial contemporary research establishing cultural differences in navigating computer environments exists (Adeoye & Wentling, 2007).

The population was a sample by convenience. The samples reflect two popular textbooks used in one educational leadership class that promotes transformational leadership; however, the study was representative of university classes in general because the textbooks and leadership philosophies are referenced throughout University of Phoenix doctoral programs on leadership. Therefore, results cannot be generally applied to a larger population, only suggested.

Chapter Summary

The study compared transformational leadership practices as presented in two textbooks with virtual team leadership identified in peer-reviewed journal literature during 2005 to 2010. Group task accomplishment with members not bound geographically is rapidly

becoming a normal activity for education and business. More than 13 million workers are involved in virtual project teams (Arnold, 2008). The study addressed a proactive strategy toward understanding leadership competencies for virtual teamwork. Transformational leadership competencies are outlined using the Five Factor model (Antonakis & House, 2002). The study may offer virtual team leaders a better understanding of skills, knowledge, and attitudes required for effective virtual team leadership.

The literature reviewed in Chapter Two presents the relatively new phenomenon of virtual teamwork when compared to the established protocols of transformational leadership. Chapter Three identifies the methodology for comparing transformational leadership competencies found in the two textbooks with the leadership competencies in peer-reviewed journal literature using computer software, specifically Catpac II™ and SPSS®. Chapter Four provides content analysis coding results. Chapter Five provides interpretation of manifest and latent coding with recommendations after submitting literature and textbooks to analysis through Catpac II™ and SPSS® software.

CHAPTER 2

LITERATURE REVIEW

The content analysis study linked transformational leadership practices with virtual teams. Chapter 2 reviewed general themes of transformational leadership competencies and made possible connections to the literature of virtual team leadership. The current peer-reviewed literature on virtual team leadership was read manually after the data collection for Chapter Four. Manually reading was purposefully postponed to prevent prejudicing the outcomes by the researcher through selection bias. Stated otherwise, the peer-reviewed literature was not manually read until the software (Catpac II™) had created the data.

Few objective studies explore leading from afar (Avolio & Yammarino, 2002; Kark & Shamir, 2002). The study may add to the body of knowledge on leading virtual teams through the construct of transformational leadership. Initial review of the literature using a KWIC title search of transformational leadership yielded plentiful peer-reviewed journal literature in transformational leadership, which is consistent with studies by Dumdum et al. (2002) and Parry (2002); the number of peer-reviewed articles is increasing regarding collaborative virtual environments (CVE) as dependency on technology access continues to increase. The study attempted to connect the two disciplines. The literature review focus was an overview of the competencies for transformational leadership.

The peer-reviewed journal literature covering leadership of virtual teams is the sample for Catpac II™ and SPSS® software to analyze; therefore, it was not included in the initial literature review. Reviewing the literature on leading virtual teams before data

collection may introduce an internal threat to validity. The literature review was rewritten after the data collection and analysis in Chapters Four and Five. The peer-reviewed literature sample includes 12 articles used as the sample.

Title Searches

The population for the content analysis were documents from EBSCOhost©, Gale PowerSearch©, and ProQuest© in the University of Phoenix Library. The Library is virtual and exists online. The population titles and abstracts were scanned applying keyword limiters to develop a unique sample for a comparative content analysis (see Table 1).

Table 1

Search hits from University of Phoenix Library using search limiters of 2005 to 2010, expanders, peer-reviewed, and quotes.

	EBSCOhost	Gale PowerSearch	ProQuest
team	100	9,982	32,716
virtual team	100	27	587
virtual team leadership	2	3	13

Note: The hit counts represent redundant articles and references from the three databases in the University of Phoenix Library General Resources section. The "virtual team leadership" search yielded 12 unique articles for sample comparison. Articles collected May 1, 2011 through May 9, 2011.

The resulting sample of 12 articles for analysis is listed in Appendix A. The search limiters were "virtual team leadership" and peer-reviewed journal articles from 2005 to 2010. Quotations at the beginning and end of the search phrase (KWOC) were more successful than traditional Boolean searching (KWIC). The use of Boolean search strategy yielded many hits that included the individual words *virtual* and *team* and *leadership*, but not as a string representative of the concept *virtual team leadership*. Stated otherwise, if an article had the words *virtual* and *team* and *leadership* anywhere, it was considered a positive search hit. The disadvantage with KWIC searching is the tendency to show incomplete targets, hits that have all the search words but not as a phrase (Lewandowski, 2008). Differentiating KWOC from KWIC was achieved from manually reading the abstracts as well as quotations encompassing the search phrase. From the large collection, 12 articles were gleaned that fell within the parameters of 2005 to 2010. One article, Shuffler et al. (2010) was familiar to the researcher. The remaining 12 articles yielded a sufficient sample for content analysis and testing the hypothesis.

Refining the literature base to meet a post-2005 requirement eliminated the early work of pioneers in the field of virtual environments. However, the validity of the research question necessitated eliminating older work to reveal relatively current practices. The resultant selection of 12 articles is a succinct review of readily available peer-reviewed journal knowledge regarding the application of leadership for virtual teams.

Articles

Peer-reviewed articles, because of their timeliness, provide the population from which to build the sample. The sample literature review draws from 12 selected peer-

reviewed journal articles. Virtual environments are a relatively young phenomenon when compared to other major changes in leadership training (Luppicini, 2007). The available literature is limited on multidimensional studies for virtual teams; much of what is available is education focused research (Luppicini, 2007). The peer-reviewed journal articles chosen for the sample outline the uniqueness of virtual team leadership.

Research Documents

During the first week of May 2011, forty-five dissertations were listed in the ProQuest© section of dissertations and theses in the University of Phoenix Library include *virtual team leadership* as a single phrase (KWOC), with a spike of 15 occurring in 2008. Thirteen of the 45 are from the University of Phoenix, indicating a relatively high interest by University of Phoenix students during the sample period (2005 – 2010), compared to other universities regarding the phenomenon of virtual team leadership. Dissertations are not included in the analysis sample because the content in a dissertation is generally a restatement of peer-reviewed literature in their respective literature reviews. The purpose of the study is quantitatively comparing (2005-2010) peer-reviewed journal literature to textbooks. No dissertation was found in the University of Phoenix Library that covered the same content analysis comparing transformational leadership competencies with peer-reviewed journal literature targeting virtual teamwork leadership.

Journals Researched

One particular journal stands out as a venue for reviewing frontiers in virtual leadership and virtual teams: the *International Journal of e-Collaboration.* Three of the 12 sample articles are represented by the *Journal*. Appendix A lists seven journals identified through the KWOC title search used to build a sample for analysis. Three

countries represented in the sample of 12, suggest a modest global interest in virtual teamwork leadership.

Historical Overview

The themes of the study were transformational leadership, virtual teams, and comparison of knowledge bases using technology assistance. A meta-analysis of leadership articles from 1990 to 1999 revealed transformational leadership was the most researched leadership topic (Dumdum et al., 2002). Leading virtual teams is a phenomenon of the past two decades. Until desktop computer technology provided the means for people to meet independent of space and time, virtual teams were not possible aside from older tools of surface mail and telephones.

Transformational and transactional leadership styles were conceptualized by Burns (1978), who believed that both styles are necessary, in varying degrees, for effective team interaction (Bass & Riggio, 2006). Transformational leadership was made popular by the work of Bass in the 1980s through the Multifactor Leadership Model. The emphasis in leadership on affective management of followers replaced a transactional relationship of power. Followers under transformational leadership become partners in directing the organization and therefore less subordinate, or such is the perception. Perception and relationships become the driving force for change within transformational leadership.

According to transformational leadership theory, leadership resides in the relationship between leader and followers. According to Bass (1985), leadership should focus on social vision and change rather than on attaining organizational goals.

Transformational leadership empowers individuals at all organizational levels to assume leadership roles; employees are inspired to excel.

Interaction among virtual team members requires clear and succinct communication to support a collaborative work group environment. One challenge a virtual team encounters is the lack of para-communication cues, such as facial expressions and nonverbal cues provided through body language (Connelly, Gaddis & Helton-Fauth, 2002). Virtual teams may eventually learn to communicate as effectively as F2F teams if they are allowed to develop intra-group relationships (Tutty, 2006; Tutty & Klein, 2008). The process may take longer for virtual teams than for F2F teams because casual conversations are the basis for developing these relational ties. Pauleen (2003) was the first to identify three steps for leadership of virtual teams, thus benchmarking a relatively new phenomenon. The three steps are assessing conditions, targeting level of relationship and creating strategies (Pauleen, 2003). Nunamaker et al. (2009) concurs with an outline of nine principles for an effective virtual team, the three essential to leadership are realign rewards to match virtual team structures, create activities that cause people to get to know each other, and "find new ways to focus attention on tasks," (pg. 2).

A revival of research interest in virtual teams may be attributed to stronger technology and institutional needs (Liu et al., 2007). Technological advances are essential to supporting graphically rich, desktop virtual environments that transcend time zones and geographical proximity while meeting the needs of learners (Clark & Mayer, 2008). Projecting future trends based upon past success was the position of the study and work of other researchers (Baron & Bruillard, 2007; Hew, Kale, & Kim, 2007). As

recently as 2010, Shuffler et al. asserted that "significant gaps still exist in our understanding, particularly in terms of virtual team leadership" (p. 3).

Current Findings

The ubiquitous textbook is accepted as a norm for imparting current wisdom (Bean, 2008; Johnson, 2005). The value of the comparison textbooks is assumed by their inclusion in doctoral level coursework. Each of the selected textbooks has homogeneous editorial content representing the views of many sources all promoting transformational leadership as the premier model for contemporary leadership. As a fundamental resource, textbooks shape teaching and learning (Kajander & Lovric, 2009). Time pressures on instructors to adopt textbooks and authors to create textbooks are threats to the accuracy of the content (Steuer & Ham, 2008). Textbooks institutionalize information, but not necessarily the most current research (Stambaugh & Trank, 2010). Transformational leadership was difficult to present as one simple comprehensive list of competencies (see Appendix C); several textbook authors propose an integrative theory.

Collaborative Virtual Environments (CVEs) can be defined as either text-based environments, some with audio and media support, or varying degrees of immersion through desktop computer environments. The arguments for F2F as the superior mode of group communication are waning considering the results of two studies (Tutty, 2006; Tutty & Klein, 2008) comparing individual and group performance. In constructivist philosophy, the determinant is the goals. Virtual collaboration yields higher order thinking and project performance (Tutty, 2006; Tutty & Klein, 2008). However, if individual effort is the desired outcome, then F2F group work is preferable (Tutty & Klein, 2008). Counterbalancing the definitive work on performance, Luppicini's (2007)

study yielded mixed results. In our global society, where the ability to produce and perform in collaboration is a desired work skill, increasing opportunities to practice is an essential component of education. CVE concepts have been used in many systems over the past few years. Applications of such technology range from military combat simulations to various civilian commercial applications (Bochenek & Ragusa, 2004).

Textbook Transformational Leadership Competencies

The Transformational Leader: The Key to Global Competitiveness (Tichy & DeVanna, 1990) begins the text-to-text comparison with a succinct overview of transformational leadership competencies. On pages 125 to 130, Tichy and DeVanna (1990) outline seven core competencies, also located in Appendix C:

1. They identify themselves as change agents.
2. They are courageous individuals.
3. They believe in people.
4. They are value driven.
5. They are life-long learners.
6. They have the ability to deal with complexity, ambiguity, and uncertainty.
7. They are visionaries.

The seven core competencies (Tichy & DeVanna, 1990) contain root concepts reminiscent of the Multifactor Leadership Quotient (MLQ) and the Full Range Leadership Theory (FRLT) identified in the second comparative text, edited by Avolio and Yammarino (2002). An example of each of the seven competencies is accompanied by a description of a salient individual leader. For example, Don McKinnon of the pharmaceutical company CIBY-GEIGY displayed courage by his unwillingness to

submit to popular opinion. According to Tichy and DeVanna (1990), this courage was built upon a strong self-image (ego) that did not require approval from others. Transformational leadership places people in the forefront, empowering the followers through core values shared in a vision that demonstrates trust. Change is the expectation for leadership; the style of change is determined by how the followers are treated. A shared vision begins with an understanding of the future state of the organization (Tichy & DeVanna, 1990). Change is a process rarely without conflict; according to Church (2007), our brains are conditioned to resist change. The challenge for leaders is developing motivational strategies to move their followers from short-term memories to long-term habits (Church, 2007).

In another example from the textbook (Tichy & DeVanna, 1990), John Harvey-Jones discusses the importance of a value-driven organization. The core values articulated by the organization must be consistent with the beliefs of the followers and the organizational practices. Any differences will threaten performance and trust. Trust within teams is crucial to performance (Costa, Roe & Taillieu, 2001). Competency Five builds upon the need for trust, especially the freedom to fail and learn from mistakes (Tichy & DeVanna, 1990). Lifelong learning is more than attending classes and reading; Harvey-Jones (Tichy & DeVanna, 1990) stresses the need for maintaining a culture whose critical values embrace the freedom to learn from mistakes. Dreaming about what-can-be must be a legitimate value for leadership to share a vision effectively with the organizational stakeholders; such dreaming requires time for reflection and transformation.

Lifelong learning builds disciplined thinking essential to the ability to problem-solve in the complex and often ambiguous business climate (Tichy & DeVanna, 1990).

The second text, *Transformational and Charismatic Leadership: The Road Ahead* (Avolio & Yammarino, 2002), is an edited collection of writings. The various authors offer a variety of similar factors, characteristics, and competencies (see Table 2) that evolved from Burns' (1978) seminal distinction between a transforming transactional leader and transformational leader. Bass proposed that transformational leaders are agents of change who affect their followers' attitudes, beliefs, and motives to consider the needs of the organization as a priority over self (Antonakis & House, 2002). According to Bass, the transformational leader provides a vision that further develops the emotional relationship with followers (Antonakis & House, 2002). Bass further states that elements of transactional leadership are needed to support transformational leadership (Antonakis & House, 2002). From integrating transactional and transformational leadership styles, the FRLT developed. Four of the nine factors are proposed as distinctly transformational (Antonakis & House, 2002).

Table 2

Comparison of Transformation Leadership Characteristics

Excerpt from Full Range Leadership Theory	Bass (1985)	Multifactor Leadership Quotient outcomes	Tichy and DeVanna (1990)
intellectual stimulation	agents of change	innovative thinking	change agents
intellectual stimulation		acts with integrity	courageous
individualized consideration		coaches people	believe in people
idealized influence		acts with integrity builds trust	value driven
intellectual stimulation		innovative thinking	life-long learners
intellectual stimulation			deal with complexity, ambiguity, uncertainty
idealized influence	provide vision	inspires others	visionaries
idealized influence	develop emotional relationships		

Note: Competencies, characteristics, and factors are terms used synonymously.

The four factors that concern transformational leadership are idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration.

Idealized influence is defined by two concepts, idealized influence (behavior) and idealized influence (attributes). Each of the four factors has competencies that articulate specific behaviors from the FRLT as it applies to transformational leadership (Popper & Mayless, 2002). Representative target competencies for comparison from FRLT are listed in Appendices B and C. Appendix B is the manifest terms and Appendix C reflects the resulting latent terms.

Dumdum et al. (2002) add the importance of follower trust and satisfaction to the textbook presentation on transformational leadership. By extending the four factor model's broad concepts, the effectiveness of follower satisfaction on performance is included. Improving satisfaction shows a direct correlation to improved performance. The next group of authors in *Transformational and Charismatic Leadership: The Road Ahead* (Avolio & Yammarino, 2002) focuses on specific solutions to transformational leadership competencies. Whereas the previous authors offered broader characteristics and factors, such as Idealized Influence, Popper and Mayless (2002) provide measurable actions, which may be used as competencies that are observable. As a measurable activity, the terms also become code words to quantify (see Table 3). Popper and Mayless (2002) on page 211 stated that transformational leaders and good parents had numerous traits in common. "The resemblance between transformational leaders and good parents is expressed in the following main aspects:

1. Both are sensitive and responsive, showing individual consideration to their protégée
2. both reinforce the protégée's autonomy
3. in a supportive and non-judgmental way

4. and by actively providing opportunities, promoting relevant experiences, giving explanations, etc.
5. and both are positive examples to identify with and look up to."

Table 3

Representative Terms for Individualized Consideration

	Manifest Terms	Latent Terms
Popper & Mayless (2002)	sensitive responsive supportive non-judgmental kind gentle warm optimism trusting	care for others pay attention to followers' developmental needs support followers' personal development coach followers' personal development reinforce autonomy provide opportunities promote relevant experiences give explanations positive examples low in aggression and criticism strong motivation to give dispositional optimism share a vision with enthusiasm inspire others positive outlook on life

Note: Individualized Consideration is one of four factors for FRLT.

Connelly et al. (2002) delve into this affective domain. The transformational approach depends on winning the trust of people (Burns, 1978). The stronger emotional intelligence a leader possesses, the better his or her relational management (Connelly et al.). The ability to manage the emotional self and the emotional needs of others is attributed to the inspirational influence mentioned as a factor in transformational leadership. Emotions and emotional management abilities are elusive and difficult to measure; especially challenging for the study is the importance of research of bodily and verbal cues, as such cues are absent in virtual teamwork (Tutty, 2006; Tutty & Klein, 2008).

Virtual Teams from Literature

Teams have the dual purpose of problem-solving and affective activities (Neji & Ammar, 2007; Reinig et al., 2009). Teams are built purposefully or serendipitously with the belief that a collective effort can solve a problem with greater efficiency than working individually. In *Effects of Collaborative Mode and Group Composition in Computer Mediated Instruction* (2008), Tutty identified differences between F2F activities and virtual group think for delivering group writing tasks in his dissertation and in a co-authored piece comparing online and F2F (Tutty, 2006; Tutty & Klein, 2008). CVEs increase group communication better than their F2F counterparts (Tutty & Klein, 2008).

Leadership and the desire for a leader in team projects are positively related in studies by An et al. (2008) and Foo et al. (2006). "A study of 51 new venture teams showed that the presence of a distinct leader was positively related to team satisfaction" (Foo et al., p. 1). Chen et al. (2008) examined goals similar to those of the research study

by identifying the various leadership roles important for improving team effectiveness, but did not compare them to transformational leadership.

Pearce et al. (2007) explored the use of informal project management skills in the context of collaborative virtual learning environments. Informal project management skills for members of virtual meetings, virtual study groups, and virtual research teams are necessary for efficient task accomplishment and participant satisfaction (Brake, 2009; Pearce et al.). Brake (2009) built upon the efforts of leaders of virtual teams to embrace a strategy of re-skilling for leading from afar.

Five factors that An et al. (2008) identified are essential to successful group work in online environments:

1) individual accountability;
2) affective team support;
3) presence of a positive group leader;
4) consensus building skills;
5) clear instructions.

However, these skills are not unique to online environments. The difference between virtual and F2F teams may be the cross-functional nature; both are teams with tasks to accomplish, but each has unique environments for interaction (Yeh & Chou, 2005). In virtual team activities, the group is extending the team performance to embrace a generally unknown venue, specifically online. In this unfamiliar space, distinct and positive leadership is essential to avoid isolation and confusion (An et al., 2008; Brake, 2006). Informal project management skills for facilitators of online meetings are necessary for efficient task accomplishment and participant satisfaction (Brake, 2006;

Pearce et al., 2007). Brake (2006, 2009) recommends that leaders of virtual teams embrace a strategy of re-skilling for leading from afar.

Cordery and Soo (2008) state that "Virtual teams are frequently distinguished from traditional teams because members are temporally and spatially distributed, relying on technologically mediated forms of communication to coordinate their activities" (p. 488). The use of virtual teams is a relatively recent feature of business and education as determined in Arnold (2008), Nunamaker et al. (2009) and Pearce et al. (2007). "Upward of 60% of managers spend time working as part of a geographically separated virtual team" (Cordery & Soo, 2008, p. 487). Cordery and Soo identify obstacles which prevent virtual teams from accomplishing their goals that are unique, compared to co-located teams. For example, the lack of common body language cues and daily familiarity challenge the cohesiveness essential to performance excellence. A simple process of sharing information and creating a synergistic memory becomes a formalized process that is best defined by leadership (Cordery & Soo, 2008).

A transactive memory system (TMS) is proposed as necessary for encoding, retrieving, and communicating group knowledge (Cordery & Soo, 2008). E-mail is helpful for passing such knowledge, but the external leader of a virtual team needs to formalize the process by articulating minimum expectations for use of TMS to insure all members are current (Cordery & Soo, 2008). Compared to conventional F2F, the TMS development will face greater challenges and be slower (Cordery & Soo, 2008). Therefore, leadership is required to invest deeper in building trust and motivation (Cordery & Soo, 2008). One suggestion, an external leader may prime the TMS

directory by sharing with a new virtual team member the domains of expertise with personal backgrounds of others on the team (Cordery & Soo, 2008).

Critical to virtual teams, more than co-located teams, is a sense of psychological safety (Cordery & Soo, 2008). Virtual teams interact through technology-mediated communication and lack the *water-cooler* experiences that build openness. The responsibility of leadership is creating an error management culture to ensure positive organization responses to failure and mistakes (Cordery & Soo, 2008). Diversity is more likely in virtual teams compared to co-located teams (Cordery & Soo, 2008; Malhotra, Majchrzak, & Rosen, 2007). The leaders of virtual teams must find ways to build team identification while appreciating cultural differences. Malhotra et al. recommend online celebrations and awards.

Shared or participative leadership is one proposal by Cordery and Soo (2008). Shared leadership is recommended by Konradt and Hoch (2007), Shuffler et al. (2010), along with Zhang, Tremaine, Egan, O'Sullivan, and Fjermestad (2009) for improving virtual team cohesiveness, satisfaction, and performance. Delegation means empowering an internal member of the team with authority and responsibility originally reserved for a superior (Konradt & Hoch, 2007; Zhang et al.). Delegating or sharing leadership functions, such as daily communication, improves the team's sense of self-worth and flexibility (Zhang et al.).

Cutler and Smith (2007) tackle virtual team leadership as a hypothetical human resource issue. They suggest role playing a mythical company attempting to solve a cross-cultural riddle, while managing the cost of production costs. The article looks at the value of cultural sensitivity and strong interpersonal skills combined with video-

conferencing as critical to project management from afar. Cutler and Smith (2007) point out that people who are more than 50 feet away in co-located work environments are unlikely to collaborate more than once a week, suggesting that virtual teams are not significantly different than other knowledge workers.

The caution to generalizing Zhang et al. (2009) recommendations resides in the use of student teams in controlled circumstances. Student teams lack the impact of daily distractions common to workforce teams (Kahai, et al., 2007; Zhang et al.). More field studies are needed for generalizing lessons-learned in lab settings and student teams (Hambley et al., 2007).

In a definitive work drawing conclusions from actual field studies, Hambley et al. (2007) outline five themes for effective virtual team leadership providing the basis for possible future theory development. Full Range Leadership Theory (FRLT), as mentioned above and proposed in both textbooks, provides the conceptual model for many studies of virtual leadership (Hambley et al.; Kahai & Avolio, 2006). However, Kahai and Avolio (2006) focus on lab studies and most studies of virtual team performance are based upon temporary and ad hoc student groups. Hambley et al. bring relevant field study outcomes which capture the complexity of workforce virtual teams.

Addressing the question of transactional leadership versus transformational leadership, Hambley et al. (2007) found that in a sample of 68 global virtual team managers, the teams with a transformational leadership style had more effective and committed teams. The first theme for an effective virtual team leader is the ability to build a virtual team (Hambley et al.). Not all workers are capable of successfully transitioning from co-located or F2F to a virtual team. Workers and leaders need specific

skills in communication technology beyond their domain expertise. The second theme for a virtual team leader is to gain the necessary training; skills similar to F2F teams with a few added requirements regarding communication technologies. Leaders must learn to *hear* the body language of their followers through email and telephones (Hambley et al.). The need to lead by example and work alongside the team is emphasized.

Establishing and maintaining effective relationships is the third major theme listed by Hambley et al. (2007) as essential to virtual team leadership. Virtual team leaders must cultivate member relationships that foster satisfaction, trust, and development. Like a transformational leader, getting to know the individual and demonstrate concerns about the person as an individual are crucial to follower satisfaction and motivation. Hambley et al. recommend periodic visits to the followers in their own environment as one specific activity that develops effective relationships.

The fourth theme (Hambley et al., 2007) is the virtual team leaders' need to manage virtual team meetings and processes. Unlike F2F meetings, virtual meetings, if not planned for efficiency, will lose participants to multitasking. Meetings need to be regular and predictable. One recommendation from Hambley et al. is to *share the pain*, by changing meeting times to reflect the diversity of time zones. Finally, the fifth theme from the field research is establishment of strong virtual team management. The concept that virtual team project management needs a stronger lead was recommended as a key difference to F2F teams (Hambley et al.; Konradt & Hoch, 2007). Leaders cannot lead virtual teams as if they were F2F teams.

Six leadership practices define the seven year field study by Malhotra et al. (2007). The team of researchers focused on innovation of virtual team leadership, which

must manage geographically dispersed followers. As a field study the data offer an excellent opportunity for development of a profile on the six practices of effective virtual team leadership:

1) Establish and maintain trust through the use of communication technology.
2) Insure diversity in the teams is understood, appreciated, and leveraged.
3) Manage virtual work-cycle and meetings.
4) Monitor team progress through the use of technology.
5) Enhance external visibility of the team and its members.
6) Ensure individuals benefit from participating in virtual teams.

(Malhotra et al., p. 62)

According to Malhotra et al. (2007), trust is harder to develop and maintain in virtual teams. Trust in geographically dispersed teams is based upon actions, because goodwill is difficult to observe. Rewards and recognition of team efforts are more difficult in virtual teams than F2F teams (Malhotra et al.). Hambley et al. (2007), agrees leaders of virtual teams should physically visit their followers and share the pain of matching meeting times to diverse geographical time zones.

The article written by LePine, Piccolo, Jackson, Mathieu, and Saul (2008) is not elaborated because the term *virtual team leadership* is mentioned once. The article was included in the sample because the sample criterion was satisfied. LePine et al. provides a meta-analysis of effective team process with virtual team leadership mentioned as one of many leadership concepts.

Using case study methodology, Pauleen, Corbitt, and Yoong, (2007) investigated virtual team leadership with an emphasis on relationships with virtual team members. In

2000, virtual teams were new and had few conceptual models from which to apply leadership (Pauleen et al.). Fast forward to 2010 and transformational leadership has proven applicable to virtual teams (Shuffler et al., 2010).

Ruggieri (2009) continues the theme of scarce field research availability on virtual team leadership, referencing back to Hambley et al. (2007). In a laboratory study using students, transformational leadership is compared to transactional leadership, with participants indicating a higher satisfaction with transformational leadership for virtual teams (Ruggieri, 2009). Other literature in the sample indicates a need for further research comparing leadership styles. In Ruggieri (2009), the four principal factors of transformational leadership: idealized influence (charisma), inspirational motivation, intellectual stimulation, and individualized consideration, are presented as an opportunity to redefine leadership. Unlike co-located teams where the physical presence of the leader provides encouragement and motivation, virtual teams depend on leadership skills devoid of physical charisma (Ruggieri, 2009). The results of the laboratory experience with students confirm the value of relationships, instead of task, by transformational leaders (Ruggieri, 2009).

Virtual teaming is an always-on process: no office hours, around the clock, and facilitated by geographically dispersed workers (Wakefield, Leidner, & Garrison, 2008). A virtual team leader must choose carefully qualified individuals for virtual teams (Wakefield et al.). Virtual team participants must possess higher than average combination of technology prowess, the ability to work independently, and social intelligence for virtual teams (Wakefield et al.; Azechi, 2005). Social intelligence for virtual environments is the understanding of the ease and structure by which members

can identify each other online (Azechi, 2005). Quoting a 2004 study, Wakefield et al. claim that over half of professional employees have worked on a virtual team, yet little empirical data exists regarding virtual team leaders.

Wakefield et al.'s (2008) team of researchers examined the role of a virtual team leader in resolving conflict. Three forms of conflict were identified: task conflict, relational conflict, and process conflict. Wakefield et al. applied a Theory of Behavioral Complexity in Leadership model that recognizes that an effective leader will display a diverse set of responses instead of simply solutions. In the context of a virtual team, a leader will apply more technology-mediated communication to manage conflict proactively (Wakefield et al.). Not all conflict is detrimental; the key for virtual team leaders is an always-on approach to distinguish intensity and value with cohesion as the goal (Wakefield et al.).

Research Variables

The research variables are competencies listed in the textbooks and the sample literature. Transformational leadership characteristics and factors are identified as manifest and latent codes in Appendices B and C (respectively). Some are relatively easy to observe and measure, such as supportive; others are more difficult, e.g., warm is an elusive characteristic. The characteristics of leadership in virtual teams, the subject of the research, are compared. The independent variable is transformational leadership competencies as identified in two online education textbooks (see Appendix B). The dependent variable is virtual team leadership competencies from peer-reviewed journal literature. Confounding variables are synonyms for either transformational leadership competencies or virtual team leadership competencies.

Conclusion

The comparative content analysis study is one effort to consider what changes may have occurred over time with respect to transformational leadership as an appropriate model for virtual teams. The textbooks by Avolio and Yammarino (2002) and Tichy and DeVanna (1990) were written at the close of the twentieth century, before technology had created a nation flowing with technology-mediated communication. More than 13 million workers are involved in virtual project teams (Arnold, 2008). Periodically, leadership paradigms need to be reviewed and possibly updated (Avolio & Yammarino, 2002). Bass (2002), in reviewing the past and present of leadership predicts, "This is a 'no-brainer'. In 2034, virtual teams and e-leadership will be the rule rather than the exception," (p. 383). Upper management needs continual learning to lead rapidly changing virtual environments (Berge, 2007).

In half of the sample literature, coaching and mentoring were mentioned, but the descriptions of virtual team leadership referenced control-related tasks, instead of the transformational leadership fundamentals. Transformational leaders are characterized by curiosity and openness (Popper & Mayseless, 2002). Transformational leaders would match the description of a Level Five Executive in Jim Collins' classic book, "Level Five leaders channel their ego away from themselves and into the larger goal of building a great company," (2001, p. 21). Many are the similarities to Kolb's experiential learning that apply to teach virtual team leadership (Kolb, 1984; Pauleen et al., 2007); especially reflection-in-action which describes the process of a virtual team leader who must innovate in the little-understood realm of virtual teamwork (Pauleen et al.).

The Chapter 2 literature review provided a background for the content analysis methodology described in Chapter 3. Content analysis is one method of research for evaluating the messages contained in written, auditory, and visual content. According to Neuman (2003), it is an underused technique. Content analysis provides the structure for a purposeful analysis with the rigor of statistical evaluation (Samkin & Schneider, 2008). Constructing a research model for content analysis requires coding content and submitting the resultant data for analysis.

CHAPTER 3

RESEARCH METHODS

The purpose of the quantitative content analysis study was comparing virtual team leadership as described in peer-reviewed journal literature with textbooks on transformational leadership. Peer-reviewed journal literature was compared through the lens of textbooks. The study compared twenty-first century virtual team leadership as described in peer-reviewed journal literature from 2005 to 2010 with two online education textbooks, *Transformational and Charismatic Leadership: The Road Ahead* (Avolio & Yammarino, 2002) and *The Transformational Leader: The Key to Global Competitiveness* (Tichy & DeVanna, 1990). The number of educational institutions engaging in virtual learning is rapidly increasing. More than 13 million workers are involved in virtual project teams (Arnold, 2008). Online distance learning poses new learning challenges for knowledge workers, students, and leadership (McKee & Massimilian, 2006). Comparing current virtual team leadership research with popular accepted textbook content may validate transformational leadership training or inspire dialogue for change.

Chapter 3 outlines content analysis methodology and the integration of information-technology assisted analysis, specifically the use of SPSS® and Catpac II™. Evaluating volumes of text material requires hundreds of manual hours looking for themes or concepts to guide leadership decisions. Manual review tends to include researcher bias. Bass (2002) and Avolio and Yammarino (2002a), in discussing the future, proposed management decision-making guided by technology; aligning their proposal with the study supported the use of the technology tools SPSS® and Catpac

II™. The study explored technology-mediated analysis of approximately 800 pages of text; the textbooks consist of 589 pages and the journal articles of 210 pages. Technology assisted analysis evaluated the 800 pages of text in seconds instead of days. The uniqueness of Catpac II™ resides in the ability of the software to learn in similar fashion to human intelligence through the construction of neural networks (Galileo, 2011). "Neural networks are the preferred tool for many predictive data mining applications because of their power, flexibility, and ease of use" (SPSS, Version 19, ¶ 1). Other content analysis software uses complex grammatical rules and dictionaries to disclose patterns; Galileo software learns the patterns in a manner similar to human thought construction (Galileo, 2011). Free from the templates and bias of a researcher, Catpac II™ uncovers patterns in the text being read (Galileo, 2011). "On the other hand, a nonhierarchical approach allows us to see some of those relationships that may not have been statistical *best fits*, but are none-the-less important in finding meaning in the text," (Battleson & Woelfel, 2009, p. 2). Manifest coding of complex behavioral concepts only reveals a small portion of the underlying message, similar to looking at the tip of an iceberg; whereas, technology can open the text to less obvious messages.

Message content is best studied using content analysis (Neuendorf, 2002). Other methodology such as control and treatment experimentation was rejected because the study does not involve subjects who can be manipulated or observed, nor are there subjects to survey. A meta-analysis of the literature was not chosen as a methodology because such was previously done by Kahai et al. (2007) regarding virtual team leadership. The Kahai et al. study is included in Appendix A. Most importantly a content analysis was chosen because the study goal is comparison of two content sources.

According to Neuendorf (2002), content analysis may conform to the same rigorous science as other forms of social and behavioral science. The content analysis study linked transformational leadership practices with virtual teams. Chapter 2 reviewed general themes of transformational leadership competencies and outlines possible connections to the literature of virtual team leadership. The current peer-reviewed literature on virtual team leadership was read manually after the data collection for Chapter 4. Manually reading was purposefully postponed to prevent prejudicing the outcomes by the researcher through selection bias. Stated otherwise, the peer-reviewed literature was not manually read until the software (Catpac II™) had created the data. Chapter 2 was rewritten in 2012 after data collection to include the 12 peer-reviewed literature articles identified in Appendix A. Reviewing the literature on leading virtual teams before data collection may have introduced an internal threat to validity.

The Catpac II™ and SPSS® software analysis is presented as a tool for comparing transformational leadership competencies with virtual team leadership competencies. Catpac II™ can be used to reveal themes independent of subjective codebooks. User-built codebooks are typical of traditional manual content analysis (Neuendorf, 2002).

Catpac II™ software improves the process of validating (or challenging) the researcher's choice of manifest and latent codes from the textbooks. According to the Galileo website, Catpac II™ is a "text analysis system that finds the underlying meaning in texts without tedious and subjective pre-coding," (Galileo, 2010, ¶ 1). Unlike content analysis software that requires dictionaries built by users, with the accompanying assumptions, the Catpac II™ software brings a higher level of objectivity, an essential

ingredient for improving comparison analysis. The Catpac II™ system removes the need for training and piloting of human coders as identified in step six of Neuendorf (2002). Oresme™ converts the text and clusters to quantitative values.

The operative terms manifest and latent coding are from the content methodology field of scholarship; the first term refers to simple clerical activities, and the latter term requires subjective evaluation. According to Catpac II™ developer Joseph Woelfel,

> "The definitions of latent and manifest coding are a bit murky, with different writers using them differently. Catpac II doesn't simply look at the relation between two or more words near each other. Rather, it simulates the function of the human brain." (Personal communication, Joseph Woelfel, July 11, 2011)

For the study, the terms manifest and latent coding persist as tools for connecting traditional content analysis methods to the study. Comparing written content in two sample textbooks with reported best practices for leadership of virtual teams is the goal of the study: comparing knowledge, skills, and attitudes in textbooks with similar concepts referenced in peer-reviewed journal literature. Making comparisons with valid and reliable instruments requires the use of the accepted language of measurement techniques.

Studies involving humans are reactive endeavors that require the observer to control interactions among participants. Latent coding and semantic analysis of content offer similar interpretive actions to those found in a qualitative study, yet they are structured within the rigor of quantitative research found in content analysis methodology (Neuman, 2003; Samkin & Schneider, 2008). Content analysis methodology has a

history of successfully comparing text and forming concepts from the text (Neuendorf, 2002).

SPSS® is statistical analysis software used for managing large amounts of data. Repeated Measures ANOVAs worked through SPSS® can compare the same words (subjects) under several different variables for testing hypothesis (Pallant, 2010). The power of the software is the ability to repeat complex statistical functions with a modest number of steps and complete reliability. The software is not subject to human coder fatigue.

Research Method and Design Appropriateness

The study was a one-tailed repeated measures ANOVA. Repeated measures ANOVA treated the terms as cases for comparing and contrasting terms. A one-tailed test is a directional experimental hypothesis. The one-tailed test of the hypothesis specifies that one mean is larger than the other (see Tables 4 and 5).

Based upon prevalence, transformational leadership is the dominant strategy proposed in University of Phoenix educational leadership doctoral courses, especially in LDR711. Chapter 1 of the study, proposed a problem with assuming textbooks and transformational leadership are the best solution for guiding virtual teams. Leadership of virtual teams driven by a volatile technological environment may need a fluid paradigm provided through current literature instead of textbook transformational leadership.

Content analysis provides the robust structure for a purposeful analysis with the rigor of statistical evaluation of text, such as textbooks and journal articles (Neuendorf, 2002; Samkin & Schneider, 2008). Content analysis is a methodology for evaluating information (Creswell, 2005; Neuman, 2003). Constructing a research model for content

analysis requires coding the source material. In the study, the source material were the textbooks and a representative sample of peer-reviewed journal articles from 2005 to 2010. After coding the two sources, the study compared similarities. Content analysis is an underused methodology (Neuman, 2003). "Content analysis is a technique for examining information, or content, in written or symbolic material," (Neuman, 2003, p. 36). The research did not show a causal relationship, nor did the study attempt to explain or explore phenomenon. The study compared two textbooks with peer-reviewed journal literature.

The data (textbooks and literature) were converted from Portable Document Files (PDF) to simple TXT files. In the conversion process page, tab and other formatting is removed. After conversion the resulting TXT files are prepared for analysis by removing chapter and page titles, along with page numbering to eliminate skewing frequency counts. Titles and other page identification do not represent the content discussion. The last step before computer-mediated content analysis is aggregating the 12 literature articles into one file and the two textbooks into another file for comparing the two sources of information. Aggregation was necessary to present data file sizes substantial enough for comparison.

The researcher built a custom dictionary (see Appendix B) that met the needs of computer-assisted content analysis. Appendix B is a manifest code of the transformational leadership competencies identified in the two textbooks. Initial coding is determined by the competencies of transformational leadership proposed in the textbooks (see Appendix B), followed by coding the peer-reviewed journal articles using Catpac

II™. Neuman (2003) identified four primary steps involved in content analysis methodology:

1. Identify body of material to analyze;
2. Create a system for recording results;
3. Record results;
4. Report results.

Neuendorf (2002) elaborates the simplistic model of content analysis with a nine-step flowchart (see Figure 1), giving attention to sampling, variables, piloting, and internal reliability, which integrates training for multiple coders to increase reliability and possibly revise the codebook in step six.

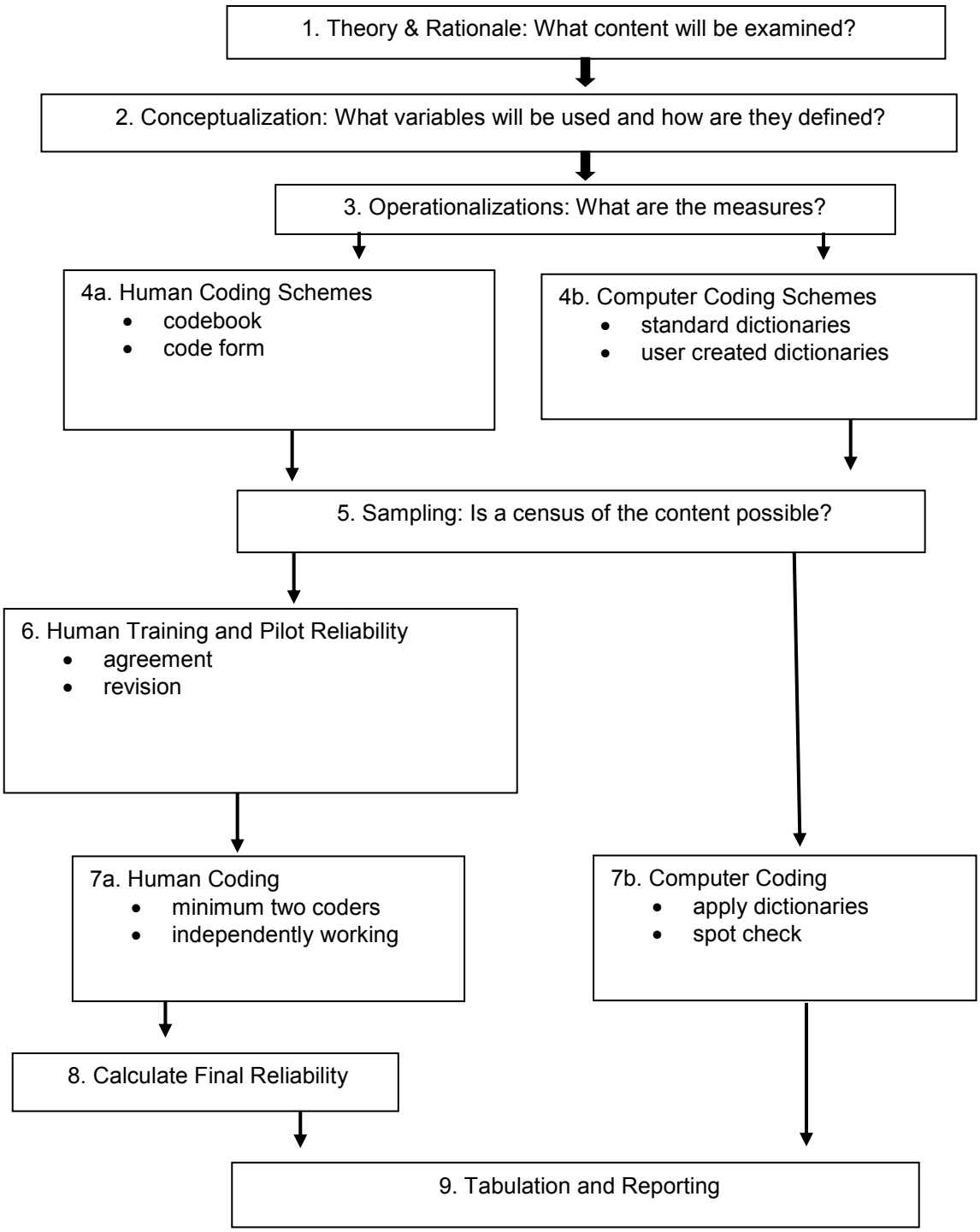

Figure 1. Simplification of "A Typical Flowchart of Content Analysis" from pages 50-51 from *The Content Analysis Guidebook* by K.A. Neuendorf. Copyright 2008 by Sage Publications.

The study bypassed steps six and eight (training and final reliability, respectively) in favor of computer analysis, as recommended by Neuendorf (see Figure 2).

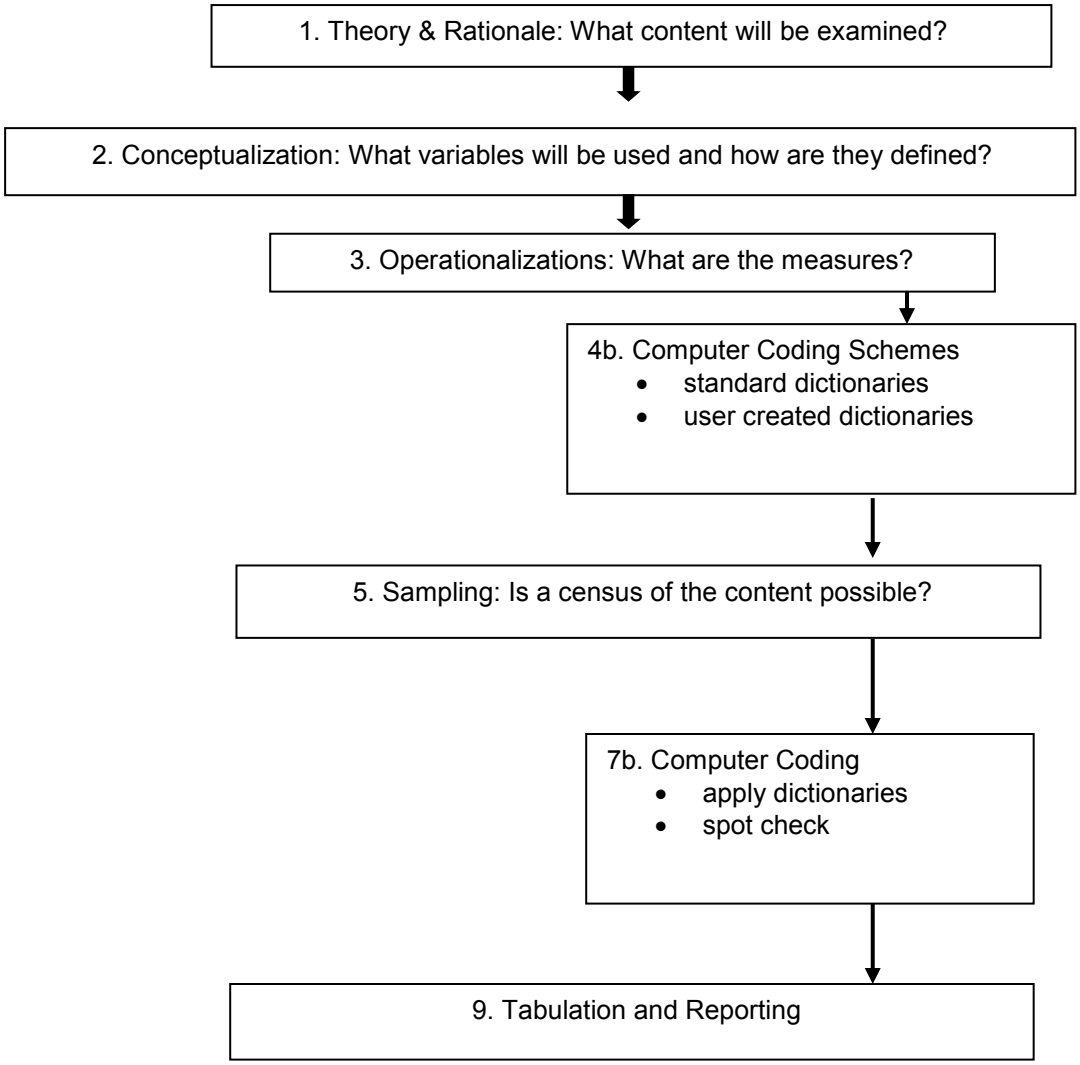

Figure 2. Adapted from "A Typical Flowchart of Content Analysis" from pages 50-51 from *The Content Analysis Guidebook* by K.A. Neuendorf. Copyright 2008 by Sage Publications.

One such recommendation for computer-assisted content analysis was Catpac II™. The software, working in combination with a suite of products from the Galileo Company, provided a computer mediated process for content analysis (Neuendorf, 2002; Skalski, 2007). The software analysis assisted the researcher in validating both manifest and latent manual coding of the textbooks. Intercoder reliability and piloting is unnecessary when using software, such as Catpac II™, because the human error associated with repeating results is eliminated (Neuendorf, 2002).

Research Questions and Hypothesis

The purpose of the quantitative content analysis was comparing virtual team leadership as described in peer-reviewed journal literature from 2005 to 2010 through the lens of two online education textbooks. The textbooks, Avolio and Yammarino (2002) and Tichy and DeVanna (1990), outline transformational leadership competencies. The independent variables are transformational leadership competencies as identified in two online education textbooks (see Appendix B). The dependent variables are virtual team leadership competencies from peer-reviewed journal literature. Confounding variables are synonyms for either transformational leadership competencies or virtual team leadership competencies. Other confounding variables are synonyms for both independent and dependent variables. Controlling the confounding variables is the role of latent codes. The following research questions guided the process:

1. Does the literature support a transformational leadership model when guiding virtual teams?
2. Do the transformational leadership competencies in F2F interaction maintain the same priority in guiding virtual teams?

The null and alternate hypothesis guided the outcomes for the computer-assisted content analysis of the textbooks and literature:

$H_0$1: No significant difference exists between two online education textbooks and recent (2005 to 2010) peer-reviewed journal literature concerning leadership competencies when allowed free association to the term ”leadership.”

H_a1: Significant difference exists between two online education textbooks and recent (2005 to 2010) peer-reviewed journal literature concerning leadership competencies when allowed free association to the term “leadership.”

$H_0$2: No significant difference exists between two online education textbooks and recent (2005 to 2010) peer-reviewed journal literature concerning leadership competencies when the analysis is defined by transformational leadership.

H_a2: Significant difference exists between two online education textbooks and recent (2005 to 2010) peer-reviewed journal literature concerning leadership competencies when the analysis is defined by transformational leadership.

$H_0$3: No significant difference exists between two online education textbooks and recent (2005 to 2010) peer-reviewed journal literature concerning leadership competencies when the analysis as defined by virtual team leadership competencies.

H_a3: Significant difference exists between two online education textbooks and recent (2005 to 2010) peer-reviewed journal literature concerning leadership competencies when the analysis as defined by virtual team leadership competencies.

Population

Within the three University of Phoenix databases, EBSCOhost© reports more than 4,000 peer-reviewed journals, Gale PowerSearch™ has more than 6,000, and

ProQuest® has more than 4,000. Comparing search results indicated a significant repetition of articles (University of Phoenix, 2010). EBSCOhost©, Gale PowerSearch™, and ProQuest® were searched through the online University of Phoenix Library General Resources using the following criteria to create a purposive sample for content analysis:

- Comparing Limiters – Full Text; Published Date: 2005 to 2010; Scholarly (Peer-reviewed) Journals.
- Expanders – Also search within the full text of the articles.
- Search modes – Find all my search terms.

Sampling

Using the following search terms, 42,523 articles were identified: team, virtual + team, and virtual + team + leadership (see Table 1). From the population of 42,523 articles, 42,511 were dropped as a Key-Word-Out-of-Context (KWOC). Stated otherwise, the fact that an article contains the word *team* does not qualify for presenting valid content to the study. Computer searching of the University of Phoenix Library using *peer-review* as a limiter also includes items such as short (200 words) articles from *USA Today* and book reviews. Filling in the search criteria *and* yields any article that contains all manifest code words located in the article but not necessarily in context Key-Word-in-Context (KWIC). For example, 212 articles were located using KWOC manifest code terms virtual + team + leadership. However, if the same terms are grouped using quotes (KWIC), "virtual team leadership", then 12 articles met the needs of the study. The use of quotes to frame the words as a single object for searching instead of a Boolean string of three individual objects generated relevant articles. Boolean search techniques alone tended to provide unreliable content sources for the study. Within the

trimmed population of 12 articles, the string (KWOC) *virtual team leadership* may have been mentioned once as an example or among the references. Dissertations were not included; dissertations represent the efforts of doctoral students reviewing textbooks and literature, and likely redundant to the study. A final sample of 12 articles was used for a quantitative content analysis.

Peer-reviewed journal literature tends toward first and second levels of information; in other words, it is comparable to primary and secondary research (Bean, 2008; Neuman, 2003). The first level implies primary information from a researcher, who is posting new information supported by the rigors of research and peer-review (Neuman, 2003). The second level implies secondary research or publishing of a review of another's efforts (Neuman, 2003).

The study used literature from a university library for analysis, not people; therefore, no informed consent was needed for the study. The population and sample represent publicly available information. Any names or identifying information were redacted prior to publication. No institutions were asked for cooperation. No previously built survey instrument was used.

Data Collection Procedures

The textbooks from University of Phoenix were originally Portable Document Files (PDFs) that were converted to text (TXT) files for scanning and analysis by the Catpac II™ software suite. After the conversion, the resultant TXT files were prepared for scanning by removing the page headers, footers, titles, and page numbers to prevent skewing the statistical occurrence and concept associations. Catpac II™ scanned the TXT files and prepared a variety of reports, such as clusters, dendograms, and frequency

counts. The scanning process takes approximately 82 seconds using a personal computer with a 2GHz processor and 2 GB of RAM. The same process was applied to the sample literature file.

The frequency of words feature of Catpac II™ outputs a list of the most commonly occurring words (see Appendix D) and dendograms (see Appendix E). Dendograms are graphical cluster analyses for grouping items. Ward's Method, the default dendogram for Catpac II™, clusters text concepts using z-scores. Oresme™, a component of the Catpac II™ software suite, provides quantitative values of word activations, for example, words connected to *change* would include *agent* or *agents*. Thoughtview™, another component of the Catpac II™ software suite, converts the resultant data into two-dimensional (2-D) and three-dimensional (3-D) graphical concept maps. Catpac II™, Oresme™, and Thoughtview™ are part of the Galileo suite of content analysis software. Oresme™ converts the text and clusters to quantitative values for input into Catpac II™ for statistical evaluation and reporting. A Repeated Measure ANOVA was used to determine mean, standard deviation, and determination of significance for hypothesis.

Appendix B lists the Multifactor Leadership Quotient (MLQ) and the Full Range Leadership Theory (FRLT) outcomes identified in Tichy and DeVanna (1990) and Antonakis and House (2002). The Multifactor Leadership Quotient and the FRLT are accepted as reliable and valid indicators of transformational leadership practice (Avolio & Yammarino, 2002). The MLQ and FLRT were used to develop the custom dictionary of latent terms and the manifest terms for comparing the content in the textbooks and the peer-reviewed literature using the Catpac II™ software. When Catpac II™ is provided

an include file (INC), such as the dictionary represented in Appendix B, the resulting reports are 100% reliable in seeking those terms. Catpac II™ is capable of creating dictionaries that emerge from the data, as well as responding to user-created dictionaries (Galileo, 2011).

Rationale

Content analysis is the best methodology for comparing large amounts of text (Neuendorf, 2002; Walk, 1998). Manual coding may require hundreds of hours of manually reading by multiple people (coders) and piloting. Using computer-assisted coding increases the validity and reliability of the process because the computer repeatedly yields the same results efficiently in seconds and without the need for training (Neuendorf, 2002). Catpac II™ provides interactive neural cluster analysis and identifies patterns as well as simple word counts (Galileo, 2011; Neuendorf, 2002). Oresme™ reveals word associations. Unlike human coding, with threats to reliability such as coder fatigue, the software scanned 589 pages of textbook content in 82 seconds, consistently and without bias.

Validity – Internal and External

Catpac II™ has the ability to tease out themes without the usual subjectively created dictionary of terms necessary for manual evaluation of a text. Catpac II™ validated the manifest and latent dictionaries created from the textbooks by the researcher, thus confirming the process recommended by Neuendorf (2002). Three dictionaries operated in the study; two (see Appendix B and C) were created by the researcher from a manual scan of the textbook, and the third (Appendix D) emerged from the data created by Catpac II™. Appendix B represents manifest terms from the

textbooks identified by the textbook authors as characteristics, abilities, and factors of transformational leadership. Appendix C are latent terms identified by the researcher that reflect the manifest terms listed in Appendix B. The emergent dictionary from Catpac II™ provided validity to the manually created custom dictionary that includes researcher and textbook bias.

Catpac II™ created emergent dictionaries from which to compare terms and concepts. Catpac II™ does not require the use of latent codes; instead, cluster analysis produces dendograms based upon levels of word co-occurrence. Through the Oresme™ input and output functions, words are associated to discover themes similar to manual latent coding that might occur as the brain creates neural networks of ideas. Confounding variables present in the literature may be revealed through Oresme™ and Thoughtview™. Such confounding variables may present a pattern of competencies for virtual team leadership not previously considered.

According to Neuendorf (2002), human piloting of the coding process using a codebook and code form is unnecessary when using software, such as Catpac II™. The software is not subject to the human flaws common to human coding of target text (Neuendorf, 2002). Manual coding would require two or more human reviewers to improve reliability. Reliance on accepted text analysis software improved the ability of the study to compare leadership concepts in a timely manner.

A small disadvantage with KWOC searching was the tendency to include incomplete targets. Stated differently, the tendency exists to include only partial concepts or phrases (Lewandowski, 2008). Incomplete concepts increase the threats to internal validity by adding confounding variables. A dendogram is a graphic representation of the

interrelation of words within a scanned text. The presence of KWIC tools such as dendograms and Oresme™ associations improves the internal validity by supplying a generalization of leadership competencies. Custom dictionaries, such as Appendix B, were known as include files (INC) during the study using Catpac II™. The use of exclude files (EXC) during the scanning minimized the phenomenon of showing high frequency words that may not relate to the study focus; an example of high frequency, non-related words are *will*, *data*, and *among*. Confounding variables are controlled through a non-hierarchical analysis inherent in the CatPac II software (Battleson & Woelfel, 2009).

Data Analysis

The independent variable is transformational leadership competencies as identified in two online education textbooks (see Appendices B and C). Appendix B is the manifest terms from the textbooks and Appendix C is the latent terms that evolved from Appendix B. The dependent variable is virtual team leadership competencies. The confounding variables are synonyms for either transformational leadership competencies or virtual team leadership competencies.

The study compared the results from Catpac II™ through the tools of frequency counts, dendograms, and Oresme™ of the textbooks and peer-reviewed literature. Agreement or similarity was sought between Catpac II™ outcomes of the textbooks with the textbooks, and the textbooks with the sample literature. The data compared proportional or percentage agreement with accepted competencies of transformational leadership (see Appendices B and C) and leadership competencies revealed in the literature.

Simple agreement or percentage agreement represents agreement between two coders (Neuendorf, 2002). Simple agreement between Catpac II™, Appendices B and C, and the literature is computed using a proportion agreement in which PA_o stands for proportion agreement observed, A is the total of agreements between two code sources, and *n* is the total number of units (Neuendorf, 2002). No agreement is represented statistically as 0.0, whereas 1.0 represents perfect agreement. The following formula determines similarity indices:

$$PA_o=A/n$$

Similarity significance for latent codes is determined using statistical application of SPSS® against the outputs of Oresme™ identified in the textbooks and the sample literature. Manifest codes are merely hit or miss, easily determined by frequency counting. The degree to which some or all of the competencies are present is explained in Chapters 4 and 5, regarding presentation and interpretation of the data.

Chapter Summary

Quantitative methodology uses numbers, proportions, and statistics generated from a relationship of variables; qualitative research explores phenomena, themes, and patterns. Quantitative methods can predict an outcome (Creswell, 2005). Content analysis is a quantitative methodology that converts communication messages into manageable data (Neuendorf, 2002).

Catpac II™ is one of several software utilities recommended by industry recognized authors Neuendorf (2002) and Skalski (2007) for facilitating content analysis. Content analysis allows a researcher with computer programs to analyze large volumes of written material successfully (Galileo, 2011; Neuendorf, 2002; Neuman, 2003). The

researcher compared virtual team leadership practices through the lens of transformational leadership. The value of the Galileo suite of computer-assisted content analysis, driven by Catpac II™, is the ability to tease out themes without the usual subjectively created dictionary of terms necessary for manual evaluation of a text. Catpac II™ validated the manifest and latent dictionaries created from the textbooks by the researcher, thus confirming the process recommended by Neuendorf (2002).

Study significance was determined using the formula $PA_o=A/n$, where PA_o stands for proportion agreement observed, A is the number of agreements between two code sources and *n* is the total of units (Appendices B and C). No agreement is represented statistically as 0.0, whereas 1.0 represents perfect agreement. Significant difference was found between the two sources and discussed in Chapter 4.

CHAPTER 4

ANALYSIS AND RESULTS

The purpose of the quantitative comparative content analysis was comparing peer-reviewed journal literature through the lens of textbooks. The study compared 12 peer-reviewed journal articles from 2005 to 2010 with two textbooks, *Transformational and Charismatic Leadership: The Road Ahead* (Avolio & Yammarino, 2002) and *The Transformational Leader: The Key to Global Competitiveness* (Tichy & DeVanna, 1990). The parametric measure ANOVA compared peer-reviewed literature with the textbooks. The study began with three hypothesizes extending the work of Bean (2008) challenging the synchronicity of textbooks with peer-reviewed literature. The null was disproved in two of three hypothesis agreeing with Bean's premise with regard to alignment between peer-reviewed literature and textbooks in the context of virtual team leadership.

Data Collection and Analysis Procedures

An include file (INC) file for Catpac II™ was built using the Appendix B list of Multifactor Leadership Quotient and Full Range Leadership Theory outcomes identified by Tichy and DeVanna (1990) and Antonakis and House (2002). The INC file is a software plug-in for Catpac II™ that forces the program to associate a custom dictionary along with allowing words to build concepts independently. The Multifactor Leadership Quotient (MLQ) and Full Range Leadership Theory (FRLT) are well documented as reliable and valid indicators of transformational leadership practice (Avolio & Yammarino, 2002). When Catpac II™ is given an INC file, such as the dictionary represented in Appendix B, the resulting reports are 100% reliable at seeking those terms within the target text material. The INC file comprised of Appendix B was used to force

the program to view the literature file through the lens of the textbook. Catpac II™ created dictionaries that emerged from the data, as well as responding to custom dictionaries (Galileo, 2011). Appendix D is one example of Catpac II™ creating a dictionary without an INC file, the software also provides simple clerical functions, such as word frequency indicator.

The activation levels of various words, as identified by Oresme™ served as the unit of analysis. Table 4 compares sources using only the lens (INC file) of Appendix B that reflected the MLQ and the FRLT. A word or group of words generate a value of activation (data point) through algorithms.

Table 4

Theme Descriptive Statistics of ORESME™ Concept Activations by Source of Information and Focus Concept and Results of Repeated Measures ANOVA with and without the Lens (INC) that Represented the Multifactor Leadership Quotient and the Full Range Leadership Theory

	Literature		Textbooks			
Focus Concept	*M*	*SD*	*M*	*SD*	*F*	*p*
Leadership	-.001	.05	.02	.08	2.52	.12
Leadership INC	-.32	.21	-.37	.26	1.64	.21
Transformational Leadership INC	-.004	.003	-.61	.44	92.49	<.001
Virtual Leadership INC	-.56	.37	-.07	.004	90.38	<.001

Note: Oresme™ provides quantitative values of word activations. INC file forces Catpac II™ to include user created dictionary. $N = 50$.

Table 5 compares all words (descriptors) that were identified by Catpac II™ in four scenarios: text, literature, text with INC, literature with INC. Using the two focus concepts and results from the repeated measures ANOVA with significance (*p<.001*, transformational leadership INC and virtual leadership INC). In Table 6, there were 133 words isolated with absolute values not equal to zero. Simply stated, 133 words (descriptors) agreed either negatively or positively across the four possible combinations of transformational leadership INC and virtual leadership INC (see Table 5); thus presenting a larger sample

Table 5

Theme Descriptive Statistics of ORESME™ Concept Activations by Source of Information and Focus Concept and Results of Repeated Measures Analysis of Variance all Words Identified by Catpac II™

	Literature		Textbooks			
Focus Concept	*M*	*SD*	*M*	*SD*	*F*	*p*
Leadership	.02	.15	.03	.23	1.07	.30
Leadership INC	.02	.27	.06	.30	3.14	.08
Transformational Leadership INC	-.01	.02	.09	.51	14.28	<.001
Virtual Leadership INC	.05	.48	-.03	.04	11.19	<.001

Note: Oresme™ provides quantitative values of word activations. INC file forces Catpac II™ to include user created dictionary. *N* = 374.

Only absolute values were used to sort the descriptors from the sample of 347. The words (descriptors) with zero values for the Oresme™ trigger *transformational* paired with *leadership* and the Oresme™ trigger *virtual* paired with *leadership* on the composite literature file were eliminated with a resulting comparison group of 133 (see Table 6).

Table 6

List of Descriptors Representing Agreement between Transformational Leadership and Virtual Leadership Focus Concept and Resulting from Repeated Measures Analysis of Variance

able	effects	influence	nurture	sensitive
altruism	empathy	information	nurturing	significant
altruistic	empowerment	innovative	openness	social
among	encouragement	inspire	optimism	stimulate
analysis	encouraging	interdependent	order	studies
authentic	enthusiasm	intimacy	organizational	study
based	example	items	organizations	support
behavior	factor	kind	original	supportive
behaviors	factors	lead	outcomes	table
charisma	first	leaders	over	task
compassion	flexibility	leadership	people	team
confident	focus	level	performance	theory
control	found	levels	proactive	time
cooperation	future	likely	problem	transformational
courage	gentle	management	process	trust
courageous	goals	managers	processes	trustworthiness
creative	group	measures	provide	two
cultural	groups	members	radical	types
curiosity	high	model	reciprocal	used
curious	holistic	moral	related	virtual

data	humor	motivate	relationships	visionaries
develop	idealized	motivation	research	warm
development	identification	mutuality	responsive	will
different	impact	need	responsiveness	within
disclosure	important	needs	results	work
effective	individual	new	role	
effectiveness	individuals	novel	second	

Note: 133 absolute value descriptors reduced from N=374.

In other words, 374 words were identified from both sources as active concepts. Only 133 words were active between the two sources. Therefore, the sources share 36 percent of concepts. The resultant list was separated into descriptors showing a positive activation in the combined textbook file using the Oresme™ trigger transformational paired with leadership and the Oresme™ trigger virtual paired with leadership on the composite literature file (see Table 7). The descriptors in Table 7 agree with transformational leadership competencies according to virtual team leadership authors Hambley et al. (2007) and Malhotra et al. (2007).

Table 7

Text and Literature Descriptors (50) of Positive Activation Representing Agreement between Transformational Leadership and Virtual Leadership Focus Concept and Resulting from Repeated Measures Analysis of Variance

able	factor	leaders	over	significant
among	factors	leadership	people	social
based	first	level	performance	studies
cultural	goals	likely	process	task
data	group	management	processes	team
develop	groups	managers	provide	time
development	identification	model	relationships	used
effective	important	organizational	research	will
effectiveness	individuals	organizations	results	within
example	information	outcomes	role	work

Note: Words are the positive activation concepts that agree between the text when triggered by transformational paired with leadership and the literature with virtual paired with leadership.

Table 6 presents 133 descriptors whose absolute values represent the terms *transformational* paired with *leadership* and *virtual* paired with *leadership* from the composite literature file. The descriptors in Table 8 represent what the two sources agree are important to leadership concepts, but not necessarily on what leadership is not and not necessarily grouped together. Another viewpoint of negative activation is clustering. For example, cats can have an equally strong activation to barking as dogs would to barking,

the former a negative value and the later a positive value or *Joker* and *Batman* towards *Robin*.

Table 8

Text and Literature Descriptors (46) of Negative Activation Representing Agreement between Transformational Leadership and Virtual Leadership Focus Concept and Resulting from Repeated Measures Analysis of Variance

altruism	curious	gentle	motivate	radical
altruistic	disclosure	holistic	mutuality	reciprocal
authentic	effects	humor	novel	responsive
compassion	empathy	idealized	nurture	second
confident	empowerment	innovative	nurturing	sensitive
control	encouragement	inspire	openness	stimulate
courageous	encouraging	intimacy	optimism	supportive
creative	enthusiasm	kind	original	trustworthiness
curiosity	focus	moral	proactive	visionaries
				warm

Note: Words are the negative activation concepts that agree between the text when triggered by transformational paired with leadership and the literature with virtual paired with leadership.

The concepts in Table 9 are a cluster of concepts that are positive to transformational leadership in the textbooks, but negative to virtual leadership. Stated differently, the concepts are essential to understanding transformational leadership.

Table 9

Text Descriptors (23) of Positive Activation from Transformational Leadership Focus Concept and Resulting from Repeated Measures Analysis of Variance

analysis	courage	items	need	transformational
behavior	found	lead	needs	trust
behaviors	future	levels	new	two
charisma	high	measures	problem	
cooperation	influence	motivation	theory	

Note: Descriptors are not positively associated to the peer reviewed literature.

The four hypothesis were solved using the formula $PA_o=A/n$, where PA_o stands for proportion agreement observed, A is the number of agreements between two code sources and *n* is the total of units (see Appendix B). No agreement between the composite literature file and the textbooks is represented statistically as 0.0, whereas 1.0 represents 100% agreement between the two sources. The reliability of the software proved 100% for locating the reference terms identified in Multifactor Leadership Quotient (MLQ) and Full Range Leadership Theory (FRLT) from the textbooks (see Appendix B).

Population and Sampling

Using the following Boolean search terms, 42,523 articles were identified using *team*, *virtual* + *team*, *virtual* + *team* + *leadership* (see Table 1). Table 1 compares the various search results. From the population of 42,523 articles, 42,511 were dropped as Key Words Out of Context (KWOC). Filling in the search criteria *and* yields any article that contains all manifest code words located in the article but not necessarily in context

(KWIC). For example, 212 articles were located using KWOC manifest code terms *virtual + team + leadership* using Boolean technique. However, the same terms grouped using quotes (KWIC), "virtual team leadership", provided 12 articles that met the needs of the study. Surprisingly, the library advanced search function would yield articles from traditional newspapers; like the popular Boolean search function many articles were unacceptable. Further study of textbook and literature comparisons may yield improved results through quotation clustering of terms instead of traditional Boolean logic.

Catpac II™ surveyed or scanned 17,971 words (data points) in the sample literature reducing to 217 active concepts. Similarly, 30,186 words for the textbooks reduced to a comparable 217 active concepts. From the total, 374 unique words or data points were identified for comparison.

Reliability

The terms in Appendix B were used for reliability and validity checking of Catpac II™ as an INC file, one hundred percent of the terms were located by the software in the two textbooks. According to Neuendorf (2002), human intercoder reliability and piloting is unnecessary when using software, such as Catpac II™, because the human error associated with consistently repeating results is eliminated. Catpac II™ is a "text analysis system that finds the underlying meaning in texts without tedious and subjective pre-coding" (Galileo, 2011, p. 1). Unlike content analysis software that requires dictionaries built by users, with the accompanying assumptions and bias, the Catpac II™ software brings a higher level of objectivity, an essential ingredient for improving content comparison analysis. The Catpac II™ system removes the need for training and piloting of human coders as identified in step six of Neuendorf (2002) as noted in Figure 1 and 2.

Using SPSS® to run Cronbach's Alpha on the eight possible focus concepts (see Table 5) with *N*=374 yields a Reliability Statistic of .72; various combinations of two, four and six yield lower scores, some are negative. A negative score violates reliability assumptions indicating all eight focus concepts are essential to the reliability of comparison between text and literature. Using Table 4 data where *N=50* yielded a Cronbach's Alpha of .66. Whereas a score of .66 is questionable, the score of .72 is an acceptable measure of internal consistency (Revelle & Zinbarg, 2009).

Data Analysis

Leadership: Table 4

As anticipated, both textbook sources activated concepts surrounding the theme of leadership in general and significantly more than the literature sources. However, given that the means of both sources are near zero, this indicates that of all the possible themes that could be activated by the sources, leadership is not a very strong theme that is activated when using only the textbooks and the literature without any qualifiers for associations.

Table 4

Theme Descriptive Statistics of ORESME™ Concept Activations by Source of Information and Focus Concept and Results of Repeated Measures ANOVA with and without the Lens (INC) that Represented the Multifactor Leadership Quotient and the Full Range Leadership Theory

	Literature		Textbooks			
Focus Concept	*M*	*SD*	*M*	*SD*	*F*	*p*
Leadership	-.001	.05	.02	.08	2.52	.12
Leadership INC	-.32	.21	-.37	.26	1.64	.21
Transformational Leadership INC	-.004	.003	-.61	.44	92.49	<.001
Virtual Leadership INC	-.56	.37	-.07	.004	90.38	<.001

Note: Oresme™ provides quantitative values of word activations. INC file forces Catpac II™ to include user created dictionary. $N = 50$.

Leadership INC: Table 4

The INC extension indicates the use of an include file in Catpac II™; the INC file forced the software to associate the words in the INC file and build associations with other words based upon internal algorithms. Although the textbook sources appear to have activated concepts surrounding the leadership INC theme more than the literature sources, the difference did not reach statistical significance as indicated by p=.21 (see Table 4). Essentially, both the textbook and literature sources tended to activate the leadership INC theme equally. Due to a lack of significance, the null hypothesis $H_0$1 is accepted.

Transformational Leadership INC: Table 4

The textbook sources activated the transformational leadership INC theme significantly more than the literature sources. Interestingly, given the strong negative activation values (-.61 and -.004; see Table 4), the textbook sources appeared to employ concept terms that differentiate transformational leadership INC from other forms of leadership, perhaps by describing what it is not. Again, the low sample lacks sufficient power of test to make a definitive statement that the data identify leadership competencies by what they do not do. The hypothesis $H_0$2 is accepted, the null rejected.

Virtual Leadership INC: Table 4

The literature sources, as expected, tended to activate the virtual leadership INC themes significantly more than the textbook sources (-.56 vs. -.07; see Table 4). Interestingly, given the strong negative activation value when comparing the means, the literature sources appeared to employ concept terms that differentiate virtual leadership INC from other forms of leadership. The hypothesis H_a3 is accepted.

Leadership: Table 5

Table 5 opens the comparison to all terms identified by the literature, textbooks, and the INC file. Unlike the smaller sample (*N*=50), the textbook sources activated concepts surrounding the theme of leadership in general the same as the literature sources. However, given that the means of both sources are near zero, this indicates from all the possible themes that could be activated by the sources, leadership is not a very strong theme that is activated when using only the textbooks and the literature without any qualifiers. With *p*=.30, there is insufficient evidence to reject the null hypothesis. Therefore, the null hypothesis $H_0$1 is accepted

Table 5

Theme Descriptive Statistics of ORESME™ Concept Activations by Source of Information and Focus Concept and Results of Repeated Measures Analysis of Variance all Words Identified by Catpac II™

	Literature		Textbooks			
Focus Concept	*M*	*SD*	*M*	*SD*	*F*	*p*
Leadership	.02	.15	.03	.23	1.07	.30
Leadership INC	.02	.27	.06	.30	3.14	.08
Transformational Leadership INC	-.01	.02	.09	.51	14.28	<.001
Virtual Leadership INC	.05	.48	-.03	.04	11.19	<.001

Note: Oresme™ provides quantitative values of word activations. INC file forces Catpac II™ to include user created dictionary. $N = 374$.

Leadership INC: Table 5

Again, an INC file was used to force the software to associate the words in the include file and build associations with other words based upon the internal algorithms. Although the textbook sources appear to have activated concepts surrounding the leadership INC theme more than the literature sources, the difference does not support statistical significance as indicated by p=.08 (Pallant, 2010). Significance is accepted when p is less than .05, this indicates that a statistically significant difference exists between the two means compared. Essentially, both the textbook and literature sources

tended to activate the leadership INC theme equally. Due to a lack of significance, the null hypothesis $H_0$1 is accepted.

Transformational Leadership INC: Table 5

The textbook sources tended to activate the transformational leadership INC theme significantly more than the literature sources. Given the positive activation value (*M*=.09 and *SD*=.51), the textbook sources appeared to employ concept terms that differentiated transformational leadership INC. Given the negative activation value (*M*=-.01) and small standard deviation (*SD*=.02), the literature sources appeared to employ concept terms that differentiated transformational leadership INC by describing what it is not rather than what it is. Significance was found because $p<.001$. Thus rejecting the null hypothesis $H_0$2 and accepting the alternative.

Virtual Leadership INC: Table 5

The literature sources tended to activate the virtual leadership INC theme significantly more than the textbook sources. Given the positive activation value (*M*=.05 and *SD*=.48), the literature sources appeared to employ concept terms that differentiate virtual leadership INC. Given the negative activation value (*M*=-.03) and small standard deviation (*SD*=.04), the textbook sources appeared to employ concept terms that differentiate virtual leadership INC by describing what it is not rather than what it is. However, negative activation was below the threshold and the items were ignored as the goal was grouping items together. Significance was found because $p<.001$. Therefore rejecting the null hypothesis $H_0$3 and accepting the alternative.

Research Questions

The purpose of the quantitative study was comparing virtual team leadership as described in peer-reviewed journal literature from 2005 to 2010 through the lens of two online education textbooks outlining transformational leadership competencies. The independent variables are the competencies outlined in the textbooks (see Appendix B); the dependent variables are virtual team leadership concepts from peer-reviewed journal literature. Confounding variables are the synonyms for either transformational leadership competencies or virtual team leadership concepts.

The following research questions guided the process:

R1. What leadership model does peer-reviewed journal literature support when guiding virtual teams?

R2. How much alignment exists between the textbook and peer-reviewed journal literature for virtual team leadership?

Hypotheses

In addition to the research questions, the following null and alternative hypothesis guided the analysis of the textbooks and literature:

$H_0$1: No significant difference exists between two online education textbooks and peer-reviewed journal literature (2005 to 2010) concerning leadership competencies when allowed free association to the term "leadership."

H_a1: Significant difference exists between two online education textbooks and peer-reviewed journal literature (2005 to 2010) concerning leadership competencies when allowed free association to the term "leadership."

$H_0$2: No significant difference exists between two online education textbooks and peer-reviewed journal literature (2005 to 2010) concerning leadership competencies when the analysis is defined by transformational leadership.

H_a2: Significant difference exists between two online education textbooks and peer-reviewed journal literature (2005 to 2010) concerning leadership competencies when the analysis is defined by transformational leadership.

$H_0$3: No significant difference exists between two online education textbooks and peer-reviewed journal literature (2005 to 2010) concerning leadership competencies when the analysis as defined by virtual team leadership competencies.

H_a3: Significant difference exists between two online education textbooks and peer-reviewed journal literature (2005 to 2010) concerning leadership competencies when the analysis as defined by virtual team leadership competencies.

Using the formula $PA_o=A/n$ two of the three alternative hypothesis were accepted; H_a2 and H_a3 agreed with Bean's (2008) premise that textbooks and literature are not synchronized when comparing transformational literature and virtual team leadership. However, only two of the 12 literature sources specifically promoted transformational leadership as the preferred model (Hambley et al., 2007; Malhotra et al., 2007).

Similarity significance for manifest codes was determined using statistical organization by SPSS® using the outputs of Oresme™ identified in the textbooks and the sample literature. Manifest codes were either a hit or miss, easily determined by frequency counting; the value of hit may be negative or positive. The value of the degree to which some or all of the competencies were present is discussed in Chapter 5. An acceptable power test of the sample placed the threshold at .80 (Pallant, 2010).

Comparing positive activation of the peer-reviewed literature through Oresme™ using the trigger *virtual* paired with leadership descriptors with the transformational leadership competencies (see Appendix B) produced four descriptors: *flexibility, interdependent, responsiveness,* and *identification*. Stated quantitatively, four descriptors from a possible 50 is 8% positive agreement between the literatures through the lens of the text; such low agreement suggests significant difference exists between the text and literature.

Summary

Transformational leadership was marginally promoted through the literature as the model most likely to bring success in leading virtual teams. Lacking in a virtual team are the body cues common to face-to-face leadership (Cordery & Soo, 2008). The literature on virtual team leadership emphasized the need for predictable and prolific communication using a variety of electronic tools.

Two focus concepts from Table 5, transformation leadership INC and virtual leadership INC, met the criterion for further evaluation of hypothesis two and three. Using the sorting function of SPSS®, the four variables represented in transformation leadership INC and virtual leadership INC were selected using absolute values and eliminating any cases (words) with a zero activation value. The resulting top cases (words positively activated) to *what is* a respective leadership competency and the bottom (words negatively activated) were assigned to other activities of leadership, but not necessarily to what leadership is not. "The negatives are below the threshold and should be ignored if you're looking for things that go together" (personal communication, Joseph Woelfel, April 6, 2012); Woelfel is the lead designer on Catpac II™. The

resulting 133 words in Table 6 represent a comparison of manifest descriptors for what is virtual leadership and transformational leadership; stated otherwise, determining what is being activated in contrast to a concept (e.g., the Joker activated when Batman is activated) is just as useful in distinguishing the concept as a positive activation (e.g., Robin activated when Batman is activated). A leadership example is courageous; the descriptor may be used for actions a leader makes, but not for what is required. Only four items of positive agreement could be argued as demonstrating that a significant gap exists between the 50 transformational leadership competencies (see Appendix B) and the 168 descriptors identified in the virtual leadership literature.

However, 129 negative activation descriptors are a complex array of concepts that cluster around leadership and are less easily categorized to support the alternative hypothesis quickly by saying what leadership is not. "On the other hand, a nonhierarchical approach allows us to see some of those relationships that may not have been statistical *best fits*, but are none-the-less important in finding meaning in the text," (Battleson & Woelfel, 2009, p. 2). Without the insight provided by Oresme™ software, the literature sources would not have been given a voice free of researcher bias who may be influenced by authoritative textbooks. Content analysis using Catpac II™ is quantitative with respect to the Oresme™ values, but descriptive (qualitative) in Chapter 5. The value of the degree to which some or all of the competencies were present is discussed in Chapter 5.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Undertaking the data analysis using a non-hierarchal content analysis tool (Catpac II™) leveraged the data to speak freely in Chapter 4 and avoid any bias from Bean's thesis (2008). According to Bean (2008), textbooks tend to restate textbooks for the sake of expediency with a resultant loss of connection to field practitioners. Textbook authors write under pressure to publish and tend to lack practical field experience; in other words, the ivory tower armchair philosopher phenomenon (Bean, 2008). The beginning assumption with the research project was the same phenomenon, Bean observed, may occur for textbooks on transformational leadership and the inclusion of virtual team leadership. Chapter 5 moves the discussion from analytical to include a qualitative review.

The data collection and analysis did support the premise of textbooks and literature lacking synchronization of transformational leadership textbooks and virtual team leadership literature as demonstrated with a low 36% agreement. Comparing positive activation of key concepts of the source literature through Oresme™ using the trigger *virtual* paired with leadership descriptors with the transformational leadership competencies (see Appendix B) did result in four concepts: *flexibility, interdependent, responsiveness,* and *identification* that rise to statistical importance.

Textbook Transformational Leadership Competencies

Tichy and DeVanna (1990) began the comparison with a succinct overview of transformational leadership competencies. On pages 125 to 130, Tichy and DeVanna (1990) outline seven core competencies:

1. They identify themselves as change agents.
2. They are courageous individuals.
3. They believe in people.
4. They are value driven.
5. They are life-long learners.
6. They have the ability to deal with complexity, ambiguity, and uncertainty.
7. They are visionaries.

The seven core competencies (Tichy & DeVanna, 1990) contain root concepts reminiscent of the Multifactor Leadership Quotient (MLQ) and the Full Range Leadership Theory (FRLT) identified in the second comparative text, edited by Avolio and Yammarino (2002) and identified in Appendix B. The MLQ and the FRLT outcomes are listed in Tichy and DeVanna (1990) and Antonakis and House (2002). Multifactor Leadership Quotient (MLQ) and the Full Range Leadership Theory (FRLT) are well known as reliable and valid indicators of transformational leadership practice (Avolio & Yammarino, 2002).

In 2002, Bass reflected on his predictions from 1967 and proposed that during the next 30 plus-years "Leaders will be prized for their innovativeness, responsiveness and flexibility, all linked to their greater frequency of transformational leadership behavior" (Avolio & Yammarino, 2002, p. 382). According to transformational leadership theory, leadership resides in the relationship between leader and followers. According to Bass (1985), leadership should focus on social vision and change rather than attaining organizational goals.

Transformational leadership empowers individuals at all organizational levels to assume leadership roles; employees are inspired to excel. Interaction among virtual team members requires clear and succinct communication to support a collaborative work group environment. One of the challenges that virtual teams face is the lack of para-communication cues, such as facial expressions and nonverbal cues provided through body language (Connelly et al., 2002).

Literature on Virtual Team Leadership Competencies

Cordery and Soo (2008) state that "Virtual teams are frequently distinguished from traditional teams because members are temporally and spatially distributed, relying on technologically mediated forms of communication to coordinate their activities," (p. 488). The use of virtual teams is a relatively recent feature of business and education as determined in Arnold (2008), Nunamaker et al. (2009) and Pearce et al. (2007). "Upward of 60% of managers spend time working as part of a geographically separated virtual team," (Cordery & Soo, 2008, p. 487).

Shared or participative leadership is one proposal by Cordery and Soo (2008), Konradt and Hoch (2007), Shuffler et al. (2010), and Zhang et al. (2009) for improving virtual team cohesiveness, satisfaction, and performance. Delegation means empowering an internal member of the team with authority and responsibility originally reserved for a superior (Konradt & Hoch, 2007; Zhang et al.). Delegating or sharing leadership functions, such as daily communication, improves the team's sense of self-worth and flexibility (Zhang et al.).

One caution to generalizing Zhang et al. (2009) resides in the use of student teams in controlled circumstances to study virtual team leadership. Student teams lack the

impact of daily distractions common to workforce teams (Kahai et al., 2007; Zhang et al.). More field studies are needed for generalizing lessons learned in lab settings and student teams. In a definitive work drawing conclusions from actual field studies, Hambley et al. (2007) outline five themes for effective virtual team leadership providing the basis for future theory development. Full Range Leadership Theory (FRLT), proposed in both textbooks, provides the conceptual model for many studies of virtual leadership (Hambley et al.; Kahai & Avolio, 2006). Sufficient literature suggests the need for a grounded theory of virtual team leadership.

Addressing the question of transactional leadership versus transformational leadership, Hambley et al. (2007) found that in a sample of 68 global virtual team managers, the teams with a transformational leadership style had more effective and committed teams. Theme number one for an effective virtual team leader is the ability to build a virtual team (Hambley et al.). The second theme for a virtual team leader is to gain the training necessary; for example, skills similar to F2F teams with a few added requirements regarding communication technologies. Leaders must learn to *hear* the body language of their followers through email and telephones (Hambley et al.). The need to lead by example and work alongside the team is emphasized. Establishing and maintaining effective relationships is the third major theme listed by Hambley et al. as essential to virtual team leadership. Virtual team leaders must cultivate member relationships that foster satisfaction, trust, and development. Like a transformational leader, getting to know the individual and demonstrate concerns about the person as an individual are crucial to follower satisfaction and motivation. The fourth theme (Hambley et al.) is the virtual team leaders' need to manage virtual team meetings and

processes. Finally, the fifth theme from the field research is establishment of strong virtual team management. The concept that virtual team project management needs a stronger lead was recommended as a key difference to F2F teams (Hambley et al.; Konradt & Hoch, 2007). Leaders cannot assume virtual teams can be lead as if they were co-located F2F teams.

Six leadership practices define the seven year field study by Malhotra et al. (2007). The team of researchers focused on innovation of virtual team leadership, which must manage geographically dispersed followers. As a field study the data offer an excellent opportunity for development of a profile on the six practices of effective virtual team leadership. According to Malhotra et al., trust is harder to develop and maintain in virtual teams. Trust in geographically dispersed teams is based upon actions, because goodwill is difficult to observe. In a virtual team it is difficult to reward and recognize team efforts than in F2F teams (Malhotra et al.). Agreeing with Hambley et al. (2007), leaders of virtual teams should physically visit their followers and share the pain of matching meeting times to diverse geographical time zones.

Ruggieri (2009) continues the theme of scarce research availability on virtual team leadership, referencing back to Hambley et al. (2007). In a laboratory study using students, transformational leadership is compared to transactional leadership, with participants indicating a higher satisfaction with transformational leadership (Ruggieri, 2009). In the article, the four principal factors of transformational leadership: idealized influence (charisma), inspirational motivation, intellectual stimulation, and individualized consideration, are presented as an opportunity to redefine leadership. Quoting a 2004 study, Wakefield et al. (2008) claim that over half of professional employees have

worked on a virtual team, yet little empirical data, field tested, exists regarding virtual team leaders.

Significance of the Study

The research compared a relatively recent phenomenon of virtual team leadership with proven transformational leadership competencies and demonstrated the two leadership models have more in common than not. The research study explored the significance of virtual teamwork leadership grounded in transformational leadership with an emphasis on communication technologies (Hambley et al., 2007; Malhotra et al., 2007).

According to 12 sample literature articles, leaders in today's digital society may need sophisticated communication skills leveraged by technology. Leaders need to know more regarding the needs of Generation Text (Bush, 2008) and the V-Gen (Proserpio & Gioia, 2007) to meet the affective demands of followers. Online forums are poised to take another leap as broadband technology expands opportunities for virtual collaboration to include streaming media (Colbert, 2005). Improving satisfaction and retention is important to maximizing the efforts of virtual team participants (Muilenburg & Berge, 2005; Piotrowski & Vodanovich, 2000).

Hambley et al. (2007) stress the importance of picking the right people to work in locations that are physically isolated from the team. Previous virtual team research has focused on acceptance and normalization. Considerable knowledge exists concerning transformational leadership skills and growing regarding virtual environments. The research study is one of few to blend the two disciplines. Few objective studies explore leading from afar (Avolio & Yammarino, 2002; Ruggieri, 2009, Wakefield et al., 2008);

only 12 articles were discovered during the sample period. According to Kahai et al. (2007), more field studies and fewer lab situations are needed to study the needs of leading virtual teams. The research study corroborated a meta-analysis of transformational leadership applied to virtual team leadership written by LePine et. al. (2008), but did not deliver new information from the field. Table 7, resulting from the study, identifies 50 terms which agree with both textbooks and literature. Four themes, *identification, responsiveness, interdependent,* and *flexibility* resulted from the study which agree with both sources.

Chapter 1 proposed a possible disconnect between popular textbooks on transformational leadership and contemporary literature on virtual team leadership. Bean (2005) postulated in his dissertation that textbooks may be disconnected from field observations as documented in peer-reviewed literature. Bean's premise was supported as it applied to two transformational leadership textbooks and virtual team leadership literature. This study included three hypothesis testing Bean's (2005) proposal, for two of the three, the null was rejected indicating significant difference between literature and textbooks. Two of 12 peer-reviewed literature articles (2005-2010) supported the use of a transformational leadership model as proposed in the textbooks. Ha2 and Ha3 both had significance values of $p<.005$ indicating significant differences between the textbooks and literature sources. Some notable differences between the two sources were competency in communication technology and charisma.

Assumptions

For the purposes of the content analysis study, transformational leadership was the preferred model of leadership. During the 1990s, transformational leadership was the

most researched leadership model (Dumdum et al., 2002; Parry, 2002). The validity of transformational leadership was established in multiple studies beginning with Bass (1985) and again with Parry (2002). Building upon this preference is the assumption that transformational leaders can transform or change individuals and organizations (Antonakis & House, 2002). The underlying assumption in the study is a desire to have leadership and order within group performance (An et al., 2008; Foo et al., 2006; Zhang et al., 2008). Textbooks tend to be written by academics (scholars), and peer-reviewed journal articles tend to reflect results from practitioners according to Bean (2008).

Interpretation of Results

Study significance was determined using the formula $PA_o=A/n$, where PA_o stands for proportion agreement observed, A is the number of agreements between two code sources and *n* is the total of units (see Appendix B). No agreement is represented statistically as 0.0, whereas 1.0 represented perfect agreement. Each of the code sources, text(s) and literature, contributed 217 descriptors from the Catpac II™ scans with a resultant 374 unique descriptors after accounting for redundancy. Table 6 represents 133 descriptors of agreement, either positive or negative activation. If 217 descriptors are offered from each of the two sources with 374 unique descriptors and 133 are in agreement, then basic agreement was 0.356. Comparing positive activation of the key word *virtual* from the literature paired with leadership descriptors with the transformational leadership competencies (see Appendix B) there are four concepts which emerge: *flexibility*, *interdependent*, *responsiveness,* and *identification*. Stated quantitatively, an 8% positive activation agreement between the literature and the text exists or a 92% negative activation agreement between the literature and text. Using

absolute values indicates that key concepts of leadership are highly comparable to Multifactor Leadership Quotient (MLQ) and the Full Range Leadership Theory (FRLT) as indicated in the comparison textbooks.

However, 129 negative activation descriptors are a complex array of concepts that cluster around leadership and are less easily categorized to support the alternative hypothesis quickly by saying what leadership is not. "On the other hand, a nonhierarchical approach allows us to see some of those relationships that may not have been statistical *best fits*, but are none-the-less important in finding meaning in the text" (Battleson & Woelfel, 2009, p. 2). Without the insight provided by Oresme™, the literature sources would not have been free of researcher bias influenced by authoritative textbooks and years of transformational leadership training.

Primary Study Findings

The quantitative content analysis supported one null hypothesis regarding transformational leadership textbook competencies and two alternatives. The textbook proposed transformational leadership competencies are significantly different than leadership competencies for virtual teams as demonstrated by a low 36% agreement factor. Only one null hypothesis was accepted based upon the quantitative analysis using a combination of Catpac II™, Oresme™, and SPSS®; whereas two alternative hypotheses stated significant differences exist between textbooks on transformational leadership and virtual team leadership competencies. The two sources agree on 50 terms (Table 7) and interestingly virtual leadership did not find trust as important as transformational leadership.

The studies from Malhotra et al. (2007) and Hambley et al. (2007) implied transformational leadership is preferred because of prevalence and only with slight modifications and additions. Each study recommended further study to look at what is best. At the time of publication, the peer-reviewed journal literature reported what is successful. The field research of Hambley et al. offers content which may prove to be the foundation for development of a grounded theory of virtual team leadership. Laboratory studies using student teams are not good indicators for organizational teams because they lack the dynamic complexity of a workplace environment (Kahai et al., 2007).

Field research comparing the effectiveness of transformational leadership on virtual teams is scarce (Ruggieri, 2009). In a lab study using students, transformational leadership was determined more satisfying for participants than transactional leadership (Ruggieri, 2009). Generalizing Ruggieri's results needs caution because the context was contrived using a lab environment instead of field research. Hambley et al. (2007) minimized the ambiguity through an extensive seven year and relatively recent field study involving practitioners trying the FRLT as presented in Avolio and Yammarino (2002).

There are six themes for effective virtual team leadership practices defined by Malhotra et al. (2007):

1) Establish and maintain trust through the use of communication technology;
2) Insure diversity in the teams is understood, appreciated, and leveraged;
3) Manage virtual work-cycle and meetings;
4) Monitor team progress through the use of technology;

5) Enhance external visibility of the team and its members;

6) Ensure individuals benefit from participating in virtual teams. (p. 62)

Implications

Shuffler et al. (2010) noted that "significant gaps exist in our understanding, particularly in terms of virtual team leadership" (p. 3). Leaders desiring to leverage virtual environments may use the outcomes from the study in developing better decisions regarding time and physical resource allocation. For example, a sense of individual worth (affective domain) may be improved through "shared pain" scheduling of regular meetings. Cordery and Soo (2008) suggest that application of research findings into virtual teams is lagging implementation, implying that knowledge regarding transformational leadership is not being used or transformational leadership is not acknowledged as an appropriate model for virtual teams.

Within the next decade, business will be competing for talented students to add to the workforce (Berge, 2007). Leveraging the interest in robust technological environments is essential to future productivity and recruitment (Berge, 2007; Muilenburg & Berge, 2005). Leaders in virtual environments need specific skills for virtual teams to innovate change; the skills of an effective virtual team leader are summarized by Malhotra et al. (2007) and the FRLT. Chen et al. (2008) looked at goals similar to those of this study by identifying the various leadership roles important for improving virtual team effectiveness, but did not compare them to transformational leadership.

More leaders are working with virtual followers, and the relationship between performance and leadership style was a research question in Kark and Shamir (2002) and

Walumbwa et al. (2008) studies. Leaders may use the outcomes of the study to justify a transformational leadership model guiding decisions in virtual environments when considering technology infrastructure, regular meetings, and the skill set of virtual workers. Cordery and Soo (2008) conclude the responsibility of virtual team success relies upon the leadership to mitigate the negative effects of geographic separation, diversity, dependence upon communication technologies, and collective efficacy.

The sample literature authors (except LePine et al., 2008) recommend specific training in communication technologies, and specifically media-rich technologies that move the interactions beyond text-based communication. Online workers recently transplanted from the proximity of co-workers expect to find leadership online anytime. Virtual teaming is an always-on process, no office hours, unless the participants take control. One such solution recommended by Hambley et al. (2007) is a *share the pain* strategy wherein the time of virtual meetings is rotated to honor the diversity of time zones common to virtual teams.

Role of Technology in Leadership Decisions

Bass predicted in 1967 that in the early twenty-first century managers would be supervising across distance using computers (Avolio & Yammarino, 2002). Bass continues his predictions that leaders will be social and behavioral specialists who assume the role of teachers (Avolio & Yammarino, 2002). In 2000, Bass reflected on his predictions that came true and proposed that during the next 30 plus-years "Leaders will be prized for their innovativeness, responsiveness and flexibility, all linked to their greater frequency of transformational leadership behavior," (Avolio & Yammarino, 2002, p. 382).

It is noteworthy that the same concepts, *innovativeness, responsiveness* and *flexibility,* were flagged by Catpac II™ and Oresme™ as highly positive for virtual leadership and transformational leadership. Bass (2002), in discussing the future proposed management decision-making guided by technology. Technology becomes an essential tool for sifting importance from noise within the thousands of e-mails and reports required by always-on leaders. Always-on is a phenomenon that an online environment generates for leadership and followers (McKee & Massimilian, 2006). Attending to online environments constantly, instead of honoring boundaries as participants would with F2F, becomes one key responsibility of virtual leaders to establish process expectations (Hambley et al., 2007).

Limitations

The study was limited to two textbooks (Avolio & Yammarino, 2002; Tichy & DeVanna, 1990) used by the University of Phoenix for educational leadership training. For the study, only literature from the University of Phoenix Library was used to provide a representative sample of peer-reviewed journal literature available for a comparative analysis. As indicated in the literature review, many of the studies are lab based using students for limited amounts of time on specific projects. One study (Hambley et al., 2007) was field based and global, provided a generalized viewpoint of virtual team leadership.

Recommendations for Leaders

Comparing leadership competencies in textbooks with peer-reviewed journal literature may establish the importance of transformational leadership for virtual teams. The study may offer virtual team leaders a better understanding of skills, knowledge, and

attitudes required for effective virtual team leadership. Six themes for effective virtual team leadership practices were defined by Malhotra et al. (2007). Appendix C provides specific behaviors essential for effective transformational leadership. There are four concepts: *flexibility*, *interdependent*, *responsiveness,* and *identification* from Appendix C which show statistical alignment to the literature on virtual team leadership and transformational leadership. Cordery and Soo (2008) state the responsibility of virtual team success relies upon the leadership to mitigate the negative effects of geographic separation, diversity, dependence upon communication technologies, and collective efficacy.

Significance to Leadership

Hambley et al. (2007) discovered in a sample of global virtual team managers, the teams with a transformational leadership style had more effective and committed teams. The V-Generation consists of the digital natives who have grown up immersed in robust technology, capable of multiplexing with extreme efficiency (Prensky, 2006; Proserpio & Gioia, 2007). Generation Text is more comfortable communicating through text-based forums than F2F (Ettkin, 2008). The V-Gen is immersed in simulations, virtual environments, online searching, and games (Proserpio & Gioia, 2007). Millennial are one of the newest demographics for labeling digital natives (Ng et al., 2010). Leaders in virtual environments need specific skills in communication technologies for virtual teams to affect innovative change when working with digital populations (Brake, 2006).

Within the next decade, business will be competing for talented students to add to the workforce (Berge, 2007). According to Liu et al. (2007), 90% of public community colleges have online distance learning courses. More than 13 million workers are

involved in virtual project teams (Arnold, 2008). Learning and work teams are assigned a task with very little purposeful guidance, as an expectation exists that everyone knows how to accomplish teamwork effectively (Pearce et al., 2007). The reality, as noted in anecdotal comments, is the opposite (Muilenburg & Berge, 2005). Leadership and the desire for a leader in team projects is expressed in An et al. (2008) and Foo et al. (2006).

The arguments for F2F as the superior mode of group communication are waning considering the research comparing individual and group performance online (Tutty, 2006; Tutty & Klein, 2008). Virtual collaboration yields higher order thinking and project performance (Tutty, 2006; Tutty & Klein, 2008). However, if individual effort is the desired outcome, then F2F group work is preferable (Tutty & Klein, 2008). Luppicini (2007) claims virtual teams' apparent success is due to factors such as group composition, group cohesion and goal commitment which were independent of the virtual environment.

Upper management needs continual learning to lead rapidly changing virtual environments (Berge, 2007). More leaders are tasked with virtual followers, and the relationship between performance and leadership style is in question (Kark & Shamir, 2002; Walumbwa et al., 2008). Leaders may use the outcomes of the study to justify a transformational leadership model guiding decisions in virtual environments when considering technology infrastructure, regular meetings, and the skill set of virtual workers. For example, travel expenses for members to meet, thus satisfying the affective needs of followers which transformational leadership deems as essential.

Suggestions for Further Research

Several recommendations for further research were indicated in the sample literature and the study. According to Ruggieri (2009), transactional leadership was less effective than transformational leadership for virtual team leadership; however, none of the literature looked at comparing virtual team leadership to laissez-faire style leadership as defined by Avolio and Yammarino (2002). Laissez-faire has the potential to recognize the unique empowerment suggested in shared leadership as recommended by Shuffler et al., (2010). Further research in virtual team leadership may determine laissez-faire as a better fit. Many of the literature sources clamored for more empirical field studies, questioning the value of applying laboratory studies to complex workforce environments. Hambley et al. (2007) recommended comparing the themes of virtual teamwork leadership presented in their literature across successful and unsuccessful virtual teams to determine which are most critical. Based upon Bean's premise and the outcomes of the study University of Phoenix leadership training should include virtual leadership training which does not depend upon the referenced textbooks. Also, future research could focus on creating a modified measure of virtual team leadership, such as the popular Multifactor Leadership Quotient (Avolio & Yammarino, 2002) which does not capture many of the behaviors specific to virtual team leadership. According to Pauleen et al. (2007) a separate grounded theory is needed to explain virtual team leadership. Cordery and Soo (2008) claim research into virtual teams has lagged with what is known regarding virtual team effectiveness because of the rapid evolution of the organizational form.

A quantitative presentation of words and concepts does not delve deeply into the less obvious hidden meanings alluded to by Woelfel (Battleson & Woelfel, 2009), the developer of Catpac II™. The comparison of textbook to literature perhaps is better demonstrated in a qualitative approach using latent coding to appreciate the depth of the semantics surrounding leadership competencies fully.

Summary and Conclusion

Comparing positive activation of the key word *virtual* from the literature paired with leadership descriptors with the transformational leadership competencies there are four concepts which emerge: *flexibility*, *interdependent*, *responsiveness,* and *identification*. Stated quantitatively, an 8% positive activation agreement between the literature and the text exists. The data collection and analysis supports one of three null hypothesis regarding the similarity of the two textbooks *Transformational and Charismatic Leadership: The Road Ahead* (Avolio & Yammarino, 2002) and *The Transformational Leader: The Key to Global Competitiveness* (Tichy & DeVanna, 1990) with peer-reviewed journal literature from 2005 to 2010. Based upon two alternative hypothesis the content of both sources shows significant differences between textbook presentations of transformational leadership and literature review of virtual team leadership. According to various authors virtual team leadership might be a natural extension of the transformational leadership model. The four concepts, *flexibility, interdependent, responsiveness,* and *identification* are essential skills for effective virtual team leadership and noted in the textbooks on transformational leadership.

Bass predicted in 1967 that in the early twenty-first century managers would be supervising across distance using computers (Avolio & Yammarino, 2002). "Leaders will be prized for their innovativeness, responsiveness and flexibility, all linked to their greater frequency of transformational leadership behavior," (Avolio & Yammarino, 2002, p. 382). Finally, the content analysis study questioned the alignment between peer-reviewed journal literature and two popular textbooks on transformational leadership and reached a conclusion consistent with Bean's observation (2008) wherein there are significant differences between textbooks and peer-reviewed literature. Therefore, leadership training must include a curriculum equally dependent upon peer-reviewed literature as well as textbooks.

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Appendix A: Peer Review Sample

Cordery, J. L., & Soo, C. (2008). Overcoming impediments to virtual team effectiveness. *Human Factors & Ergonomics in Manufacturing, 18*(5), 487-500.

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Appendix B: Custom Dictionary of Manifest Terms from Textbook

The following terms were used for reliability and validity checking of Catpac II™ as an include file. 100% of the terms were located by the software in the two textbooks.

The 50 KWOC terms represent manual scanning of the sample textbooks by researcher. The words were identified by the textbook authors as characteristics, abilities, and factors of transformational leadership. *Transformational and Charismatic Leadership: The Road Ahead*, (Avolio, & Yammarino, 2002) *The Transformational Leader: The Key to Global Competitiveness,* (Tichy, & DeVanna, 1990)		
altruistic	flexibility	nurturing
authentic	gentle	openness
charisma	humor	optimism
charismatic	idealized	original
compassion	innovative	proactive
confidence	influence	radical
cooperation	innovativeness	reciprocal
courageous	inspire	respectful
creative	interdependent	responsive
curiosity	intimacy	responsiveness
curious	kind	sensitive
disclosure	holistic	stimulate
empathy	moral	supportive
empowerment	motivate	trust
encouragement	mutuality	trustworthiness
enthusiasm	novel	visionaries
	nurture	warm

Appendix C: Custom Dictionary of Latent Terms from Textbook

The following terms will be used for comparison of textbooks with literature by Catpac II™.

The 284 KWIC represent manual scanning of the sample textbooks by researcher. The phrases were identified by the authors as characteristics, abilities, and factors of transformational leadership. *Page 1 of 6* *Transformational and Charismatic Leadership: The Road Ahead*, (Avolio, & Yammarino, 2002) *The Transformational Leader: The Key to Global Competitiveness,* (Tichy, & DeVanna, 1990)	
ability to communicate vision	build strong connections
ability to experience emotions	calculated risk taking
ability to express emotions	capacity to relate to others in a-
acknowledgement of follower vulnerability	pro-social way
acknowledgement of leader vulnerability	capacity to treat others in a-
activate collective self-identification	encouraging way
activate relational self-identification	capacity to treat others in a positive way
active management processes	care for others
adaptive behavior	challenge followers to view-
adopt ideals	problems from new perspectives
agents of change	change agents
alter chronic self-schemas	coach followers' personal development
ambition goals	coaching followers
appeal to follower's intellect	collective decision-making
arouse motives	collective identity
articulate a set of core values	collective self-concept
articulates how a desirable future-	communicating personality
can be reached	communicating vision
articulating vision	confident in their abilities
articulation of strategic vision	connecting followers' aim-

attending to different follower needs attributed charisma behavioral integrity belief in the ability to influence others believe in people beyond self-interest	with group interests connecting followers' personal-goals with group interests consider needs of others over their own counseling followers create a sense of self-identity create an attractive vision create social identification with-the follower's unit creating alignment around mission

Appendix C: Custom Dictionary of Latent Terms from Textbook: *page 2 of 6*

The phrases were identified by the authors as characteristics, abilities, and factors of transformational leadership. *Page 2 of 6* *Transformational and Charismatic Leadership: The Road Ahead*, (Avolio, & Yammarino, 2002) *The Transformational Leader: The Key to Global Competitiveness,* (Tichy, & DeVanna, 1990)	
creating alignment around purpose	divergent thinking
creating alignment around vision	effective coaching
culture change	effective mentoring
deal with ambiguity	emotional appeals to followers to
deal with complexity	build awareness of shared goals
deal with uncertainty	emotional appeals to followers to-
dealing with the technical side	increase awareness of shared goals
demonstration of optimism	emotional bonds with followers
demonstrating trustworthiness	emotionally expressive language
determines high standards	emphasis of leader-follower similarity
develop collective goals	emphasis on critical thinking
develop emotional relationships	emphasis on independent thinking
develop leadership in others	emphasize attractiveness of-
developing followers	organization
development of close intimate relations	emphasize distinctiveness of-
development of followers	organization
development of followers' leadership abilities	emphasizing similarities among-
developmental behaviors that focus on	workers
follower's concerns	emphasizing common ground
developmental behaviors that focus on	empowering behaviors
follower's needs	empowering followers
developmental behaviors that focus on	enabling mutual disclosure

follower's possible growth potential	encourage followers to think outside-the box
displaying respect	encouragement of expression
displays of compassion	encouragement to followers
displays of psychological support	encouraging flexible change
displays of warmth	encouraging flexible decision-making
dispositional optimism	

Appendix C: Custom Dictionary of Latent Terms from Textbook: *page 3 of 6*

The phrases were identified by the authors as characteristics, abilities, and factors of transformational leadership. *Page 3 of 6* *Transformational and Charismatic Leadership: The Road Ahead*, (Avolio, & Yammarino, 2002) *The Transformational Leader: The Key to Global Competitiveness,* (Tichy, & DeVanna, 1990)	
engender trust	helping self-actualize followers
enhance adaptability	helps followers become more creative
entranced by the world of ideas	helps followers become more innovative
envision a desirable future	high ethical standards
ethical orientation	high sense of efficacy
evoke personal agency emotions	highlight group commonalities
evoke personal challenge	highlight organizational membership
evoke personal dominance	highlighting follower membership
evoke personal pride	holistic visions
evoke personal self-assurance	idealized influence
experience a wide range of emotions	identifying vision
express wide range of emotions	inclusion of followers in decision process
expression of positive effect	inclusion of followers in planning
far-reaching goals	inclusion of followers in thinking
focusing attention	increase awareness of followers
formulation of strategic vision	increase follower's performance by-encourage
fostering the acceptance of group goals	followers to transcend self-interests
frequent contact	individual consideration
general confidence	individualized consideration
give explanations	inspirational motivation
give followers the experience of success	inspire followers to less self-centered
give salience to the collective-self-concept	inspire others
give to others	inspiring hope

healthy ego heightening the sense of follower self-efficacy help followers to be creative help followers to be original help followers to think differently	inspiring movement towards shared goals intellectual openness intellectual stimulation interest in individual as a whole internalize a parent role model

Appendix C: Custom Dictionary of Latent Terms from Textbook: *page 4 of 6*

The phrases were identified by the authors as characteristics, abilities, and factors of transformational leadership. *Page 4 of 6* *Transformational and Charismatic Leadership: The Road Ahead*, (Avolio, & Yammarino, 2002) *The Transformational Leader: The Key to Global Competitiveness,* (Tichy, & DeVanna, 1990)	
internalize a parent role model	moral orientation
interpreting past experiences of-	moral reasoning
followers in terms of group identity	moral uplifting
interpreting past experiences of-	motivating subordinates by generating-
followers in terms of group values	enthusiasm
interpreting present experiences of-	motivating subordinates by maintaining-
followers in terms of group identity	enthusiasm
interpreting present experiences of-	motivation to give in pro-social way
followers in terms of group values	motivation to lead
invite creative solutions	motivation to relate to others in-
invite innovative solutions	a pro-social way
leader and follower similarity	motivation to treat others in a-
leader and follower vulnerability	encouraging way
leadership self-efficacy	motivation to treat others in-
leadership flexibility	a positive way
learn from mistakes	mutuality in the relationship
less emotional more behavioral in	non-judgmental
coping with conflict	nurturing behaviors that focus on-
less emotional more behavioral in	follower's concerns
coping with stress	nurturing behaviors that focus on-
less inhibited	follower's needs
lifelong learners	nurturing behaviors that focus on-

live their vision low in aggression low in criticism low need for affiliation maintaining organizational identity measurement of performance at group-level	follower's possible growth potential offering support openness to new experiences openness to new viewpoint optimistic orientation towards others optimistic orientation towards self permission to risk personal identification

Appendix C: Custom Dictionary of Latent Terms from Textbook: *page 5 of 6*

The phrases were identified by the authors as characteristics, abilities, and factors of transformational leadership. *Page 5 of 6* *Transformational and Charismatic Leadership: The Road Ahead*, (Avolio, & Yammarino, 2002) *The Transformational Leader: The Key to Global Competitiveness,* (Tichy, & DeVanna, 1990)	
personal risk	risk takers
positive outlook on life	sacrificing for the group
positive self-presentation	secure individual
possess emotional intelligence	secure person
present an attractive vision	self-awareness
promote relevant experiences	self-efficacy
promoters of amendments	self-motivation
provide common vision	self-renewal
provide opportunities	self-sacrifice
provide positive examples	self-sacrificing behavior
provide resources	self-transformation
provide vision	sensitivity to member needs
providing an appropriate model	sensitivity to the environment
providing support	sets an example
Pygmalion effect	setting personal example
question status quo	shaping the work context for group
radical ideology	structure
raise followers' identification with the	share a vision with enthusiasm
group	share similar values
raising follower needs to higher levels	shift subordinates from an individual to
reactionary ideology	a collective identity
recognize that different followers have	shows confidence
different needs	shows determination

reduce feeling of inner conflict	skillful use of ceremonies
reference to group as a whole	skillful use of labels
reinforce autonomy	skillful use of metaphors
relationship management	skillful use of organizational images
resolving uncertainty	skillful use of rituals
resolving uncertainty to change	skillful use of slogans
right brain thinking	skillful use of songs

Appendix C: Custom Dictionary of Latent Terms from Textbook: *page 6 of 6*

The phrases were identified by the authors as characteristics, abilities, and factors of transformational leadership. *Page 6 of 6* *Transformational and Charismatic Leadership: The Road Ahead*, (Avolio, & Yammarino, 2002) *The Transformational Leader: The Key to Global Competitiveness,* (Tichy, & DeVanna, 1990)	
skillful use of symbols	tactical programs
slow implementation of change	taking risks
socio-emotional support for followers	team goal alignment
stimulating intellectual development	transcendent goals
stimulating intellectual thought	transcendent objectives
strategic organizational philosophy	transform follower's attitudes from-lower to higher
stressing shared ideologies	transform follower's beliefs from lower-to higher
stressing shared values	transform follower's motives from-lower to higher
strong motivation to give	translate dreams to action
structure the work as group based	unconventional behavior
support followers' personal development	use of organizational symbols
supportive behaviors that focus on follower's concerns	use of we
supportive behaviors that focus on follower's needs	value driven
supportive behaviors that focus on follower's possible growth potential	visionary behavior
tactical policies	visionary leadership
	willingness to explore unknown

Appendix D: Example Frequency List from Catpac II™ of Tichy and DeVanna (1990)

TOTAL WORDS	12700	THRESHOLD	0.000
TOTAL UNIQUE WORDS	226	RESTORING FORCE	0.100
TOTAL EPISODES	12694	CYCLES	1
TOTAL LINES	6499	FUNCTION	Sigmoid (-1 - +1)
		CLAMPING	Yes

DESCENDING FREQUENCY LIST

WORD	FREQ	PCNT	CASE FREQ	CASE PCNT
ORGANIZATION	471	3.7	748	5.9
PEOPLE	457	3.6	7	0.1
WILL	366	2.9	259	2.0
CHANGE	350	2.8	253	2.0
TRANSFORMATIONAL	235	1.9	21	0.2
LEADERS	215	1.7	63	0.5
ORGANIZATIONS	213	1.7	273	2.2
PROCESS	204	1.6	35	0.3
MANAGEMENT	201	1.6	7	0.1
VISION	181	1.4	730	5.8
TIME	176	1.4	35	0.3
GENERAL	174	1.4	251	2.0
NEED	170	1.3	493	3.9
WORK	149	1.2	252	2.0
LEADERSHIP	130	1.0	0	0.0
FUTURE	124	1.0	246	1.9
SYSTEMS	124	1.0	26	0.2
ORGANIZATIONAL	123	1.0	262	2.1
SYSTEM	121	1.0	35	0.3
MANAGERS	119	0.9	0	0.0
LEADER	118	0.9	474	3.7
TEAM	109	0.9	401	3.2
FIRST	107	0.8	368	2.9
YEARS	104	0.8	1561	12.3
IMPORTANT	103	0.8	606	4.8
TOP	102	0.8	354	2.8
TWO	102	0.8	308	2.4
CULTURE	100	0.8	58	0.5
GROUP	100	0.8	248	2.0
POLITICAL	100	0.8	7	0.1
VALUES	93	0.7	0	0.0
PROBLEM	90	0.7	800	6.3
WORLD	90	0.7	672	5.3
DEAL	89	0.7	142	1.1
NETWORKS	89	0.7	407	3.2
PROBLEMS	88	0.7	1335	10.5
TECHNICAL	86	0.7	278	2.2
CHALLENGE	84	0.7	210	1.7
CULTURAL	83	0.7	36	0.3
EMPLOYEES	80	0.6	367	2.9
PART	79	0.6	522	4.1
THINK	79	0.6	287	2.3
STRATEGY	77	0.6	0	0.0
OVER	76	0.6	502	4.0
US	76	0.6	304	2.4
COMMITMENT	74	0.6	302	2.4
INFORMATION	74	0.6	467	3.7
RIGHT	74	0.6	644	5.1
TRANSITION	74	0.6	366	2.9
UNCERTAINTY	74	0.6	303	2.4
NEEDED	73	0.6	189	1.5
HUMAN	71	0.6	815	6.4
KEY	71	0.6	417	3.3
MAJOR	70	0.6	14	0.1
PAST	69	0.5	277	2.2

ALPHABETICALLY SORTED LIST

WORD	FREQ	PCNT	CASE FREQ	CASE PCNT
ABILITY	44	0.3	300	2.4
ABLE	62	0.5	395	3.1
ACT	52	0.4	306	2.4
ALWAYS	37	0.3	0	0.0
AMERICAN	42	0.3	0	0.0
AMONG	49	0.4	256	2.0
AROUND	49	0.4	275	2.2
BECOME	50	0.4	334	2.6
BEHAVIOR	31	0.2	331	2.6
BEST	40	0.3	0	0.0
BUILDING	40	0.3	0	0.0
CEO	39	0.3	345	2.7
CHALLENGE	84	0.7	210	1.7
CHALLENGES	62	0.5	268	2.1
CHANGE	350	2.8	253	2.0
CHANGES	64	0.5	248	2.0
CHANGING	44	0.3	552	4.3
CHARISMATIC	2	0.0	402	3.2
CLEAR	45	0.4	2062	16.2
CLEARLY	37	0.3	430	3.4
COMMITMENT	74	0.6	302	2.4
COMPASSION	1	0.0	0	0.0
COMPETITION	42	0.3	14	0.1
COMPETITIVE	58	0.5	303	2.4
CONFIDENCE	5	0.0	253	2.0
CONFIDENT	1	0.0	482	3.8
CONSIDERATION	2	0.0	7	0.1
CONTROL	50	0.4	0	0.0
COOPERATION	11	0.1	255	2.0
COURAGE	6	0.0	364	2.9
COURAGEOUS	9	0.1	35	0.3
CREATE	62	0.5	7	0.1
CREATING	38	0.3	14	0.1
CREATIVE	21	0.2	319	2.5
CRITICAL	46	0.4	77	0.6
CULTURAL	83	0.7	36	0.3
CULTURE	100	0.8	58	0.5
CURIOUS	1	0.0	421	3.3
DAY	41	0.3	260	2.0
DEAL	89	0.7	142	1.1
DECISION	48	0.4	312	2.5
DECISIONS	47	0.4	541	4.3
DESIGN	47	0.4	618	4.9
DEVELOP	54	0.4	7	0.1
DEVELOPED	38	0.3	0	0.0
DEVELOPMENT	42	0.3	218	1.7
DIFFERENT	66	0.5	617	4.9
DIFFICULT	58	0.5	314	2.5
EARLY	37	0.3	306	2.4
EMPATHETIC	1	0.0	284	2.2
EMPLOYEES	80	0.6	367	2.9
EMPOWERMENT	4	0.0	265	2.1
ENCOURAGEMENT	3	0.0	272	2.1
ENCOURAGING	5	0.0	435	3.4
ENTHUSIASM	8	0.1	391	3.1

Appendix E: Example of Ward's Method Clustering Dendogram using Catpac II™

from Tichy and DeVanna (1990) textbook.