LEADERSHIP STYLE OF TECHNICAL-VOCATIONAL DEANS IN AMERICAN COMMUNITY COLLEGES: A PREDICTIVE STUDY

by

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ABSTRACT

The study tested the Full Range of Leadership model (Bass & Avolio, 1997) styles and faculty outcomes with community college technical-vocational deans and their faculty. The study investigated the faculty's and dean's self-report perceptions of the degree to which transformational leadership, transactional leadership were practiced by community college technical-vocational deans. The theoretical framework of the Full Range Leadership model is provided by Bass and Avolio (1995). This framework was measured in the study by the MLQ-Form 5X-Short, which has three subscale factors with twelve indicators.

Community colleges have emerged to have an expanding and significant place in postsecondary education. Their programs, especially the technical-vocational programs, have seen extraordinary growth in size, magnitude of mission, and complexity in the past twenty-five years (Parnell, 1990; Seagren, Wheeler, Creswell, Miller, and VanHorn-Grassmeyer, 1994). Seagren, et al. 1994, conducted the first nationwide study of academic and technical-vocational chairperson's in community colleges. The findings from this study should be useful in establishing a broader base of knowledge on only technical-vocational deans (chairpersons). Comparisons to the Seagren, et al.'s (1994) study provided a profile that had similarities and a few differences. The study adds to the base of knowledge by examining their leadership style, which was a recommendation in the Seagren study.

Through a questionnaire that included the MLQ-5X-Short and demographic information, information was obtained from 132 single campus community colleges.

The information was analyzed through descriptive statistics and structural equation modeling. The general purpose of structural equation modeling (SEM) is to provide a unique analysis that concurrently addresses both measurement and prediction questions. From the data, a model for the community college technical-vocational dean's perceived leadership style was generated. Also, a model for the faculty's perception of the dean's leadership style was determined. From these models, it was determined that a combination of these leadership styles had the greater positive impact on technical-vocational faculty job satisfaction, willingness to exert extra effort, and perceived dean effectiveness. Models for each group by gender were also examined for differences. Implications and recommendations were discussed.

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CHAPTER I

INTRODUCTION

As we begin the twenty-first century, community colleges will be hiring approximately five thousand new deans and chairpersons to fill the 40% projected vacancies (Seagren, Wheeler, Creswell, Miller, & VanHorn-Grassmeyer, 1994, p. vii). This leads us to several important questions. What is the current profile of technical-vocational deans in American community colleges? Is there a leadership style that impacts important follower outcomes of faculty satisfaction, willingness to exert extra effort, and perceived dean effectiveness? To what extent do technical-vocational deans demonstrate transformational, transactional, and nontransactional leadership as perceived by the deans and their faculty?

This research study provides information about current, effective leadership styles and background characteristics that new community college technical-vocational deans need. More important, the study determines whether transformational, transactional, or a combination of these leadership styles has the greater positive impact on technical-vocational faculty satisfaction, willingness to exert extra effort, and perceived dean effectiveness.

Studies have been done on community college leadership (Birnbaum, 1988; Roueche, Baker, & Rose, 1989; Vaughan, 1989, 1990) that have focused only on the leadership roles of presidents and the academic/instructional deans. One study by the National Community College Chair Academy (NCCCA), in partnership with the Center

for the Study of Higher and Postsecondary Education (CSHPE) at the University of Nebraska-Lincoln, did examine academic leadership in the community college (Seagren et al., 1994). This joint effort was the report of the first nationwide study of academic and technical-vocational departmental deans and chairpersons in community colleges.

Although several recent dissertations have concentrated on various facets of the community college technical-vocational dean's background characteristics and leadership style, these studies have focused only on specific disciplines within limited geographical areas. Darden (1991) studied barriers to leadership and biases toward women vocational administrators in California. Migler (1991) examined leadership attributes and styles of administrators in vocational education institutions in Minnesota's technical colleges, compared with twelve exemplary institutions nationwide. Liang (1990) and Schroeder (1988) investigated leadership attributes and perceived effectiveness of vocational education administrators in Minnesota and Texas, respectively. Archie (1997) centered her study on administrators effectiveness in the vocational-technical area of nursing dean's leadership. Nischan (1997) examined faculty leadership and student perceptions of faculty effectiveness in the business division of one community college.

> Over the past decade leadership development has been designed for Community/Technical College presidents, vice presidents, and deans to prepare them for their new responsibilities. Few, if any, opportunities have been available for Community/Technical College chairs, who outnumber all other types of administrators combined. (Seagren et al., 1994, p. vii)

This study builds on this previous research by providing a profile of technical-vocational deans and their faculty in community colleges and by examining the relationship of technical-vocational dean's leadership style on three faculty outcomes. Additionally, the

researcher examines faculty perceptions of the dean's leadership style and the relationship of their leadership style on the three faculty outcomes.

The findings from this study should be useful in establishing a broader base of knowledge on technical-vocational deans and their leadership style. Further, this study should be beneficial in examining the degree to which technical-vocational deans are using current leadership theory and determining whether or not selected leadership styles are related to important faculty outcomes. Implications for the identification, selection, and training of individuals for the dean's role in the community college's technical-vocational divisions should be evident from the study. Most important, this project tests Bass and Avolio's (1991) Full Range of Leadership model.

Conceptual Framework for Study

In forming a conceptual framework for examining the effective dean's leadership style as related to faculty outcome, Bass and Avolio's (1991, 1995, 1997) full range theory of leadership provides a useful model. According to Bass and Avolio (1991, 1995, 1997), the Full Range of Leadership model development includes the indicators of the transformational, transactional, and nontransactional leadership factors. This theory includes leadership styles that are highly transformational at one end to the nontransactional leadership style that is highly avoidant at the other end, as shown in Figure 1.1.

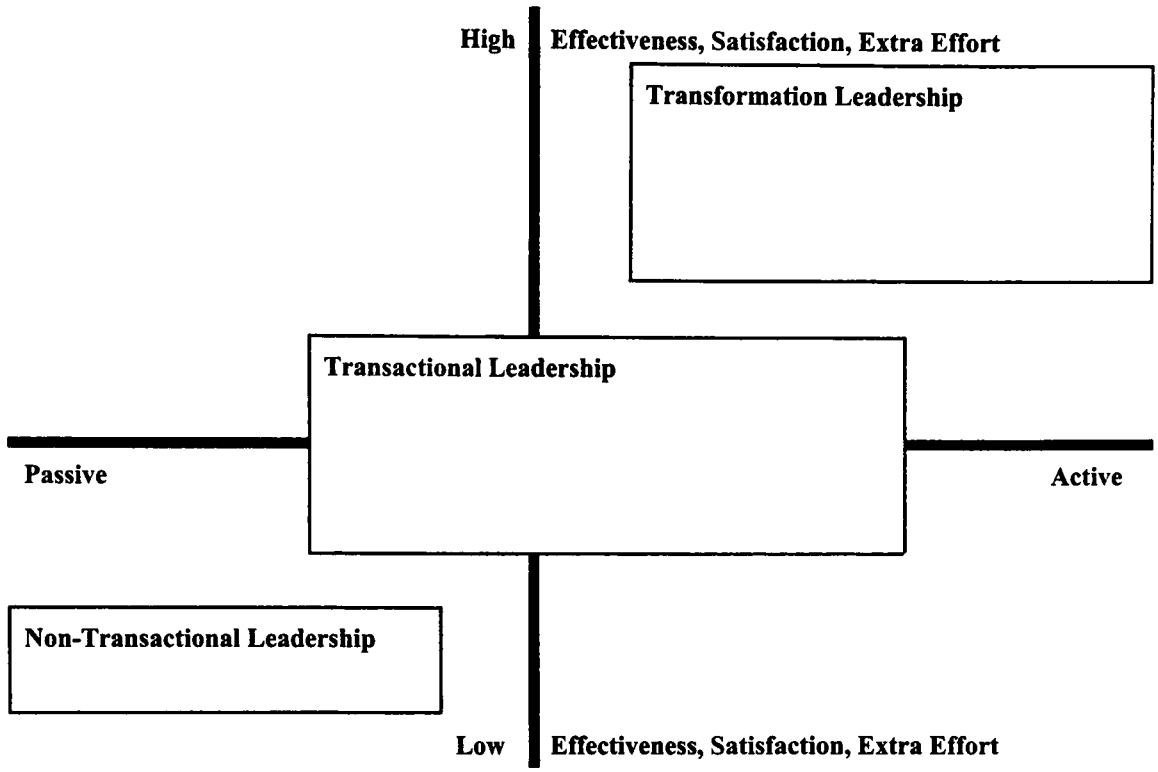

Figure 1.1 Full Range of Leadership Model--Relationship of Leadership Style and Follower Outcomes (adapted from Bass & Avolio, 1997)

Bass (1996) says, "Fundamental to the full-range leadership model is that every leader displays each style to some amount" (p. 8). He goes further to state that the full range of potential for effective leadership is achieved through both transactional and transformational leadership, not either one versus the other style of leadership (p. 22).

Bass and Avolio (1995) refined the components of the full range model to include: (1) idealized influence (attributed), (2) idealized influence (behavior), (3) inspirational motivation, (4) intellectual stimulation, (5) individualized consideration, (6) contingent rewards, (7) management-by-exception (active), (8) management-by-exception (passive), and (9) laissez-faire. The first five are

transformational indicators while the last four are transactional indicators, as shown in Figure 1.2.

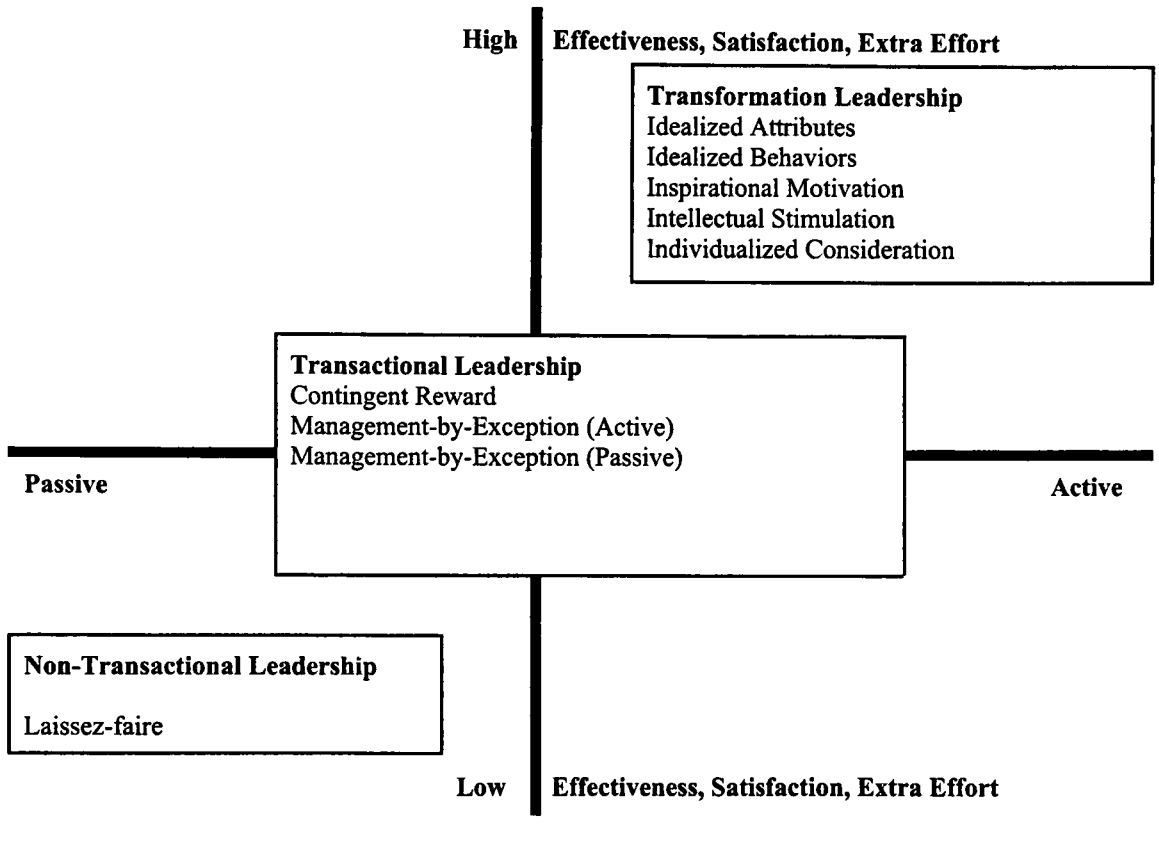

Figure 1.2 Full Range of Leadership Model--Relationship of Leadership Style Factors and Indicators (adapted from Bass & Avolio, 1997)

Statement of Problem

The problem for this study was to conduct an indepth, comprehensive study of the technical-vocational dean of single campus community colleges. As a result, this research: (1) provided a descriptive profile of the technical-vocational dean and their faculty; and (2) examined current leadership styles of the dean as perceived by the dean

and as perceived by their faculty. Bass and Avolio (1997) Full Range of Leadership Model was tested. The leadership style factors, faculty outcome factors, and selected background variables that contribute to a highly effective leadership style of community college technical-vocational deans were analyzed using structural equation modeling. The intent of this study is to address the gap in the literature on technical-vocational deans. This analysis results in a base of knowledge about community college technical-vocational deans and their faculty.

Purpose of Study

The purpose of this study was to:

1. describe the profile of the technical-vocational leaders and their faculty;
2. determine the perceived style of leadership the technical-vocational dean exhibits;
3. determine the faculty views of the dean's leadership style;
4. test whether a relationship exists between the perceived leadership style and faculty outcomes.

Research Questions

The research questions this study addressed were as follows:

1. What is the profile of the single campus community college technical-vocational dean and their faculty?
2. What is the faculty-perceived leadership style of the technical-vocational dean as measured by the Full Range of Leadership Model?

3. What is the self-perceived leadership style of the technical-vocational dean as measured by the Full Range of Leadership Model?
4. Does the faculty-perceived leadership style of the dean have an impact on their outcomes?
5. Does the dean's self-perceived leadership style have an impact on their perception of faculty outcomes?
6. Does gender affect leadership style and faculty outcomes?

Need for the Study

Community colleges have emerged to have an expanding and significant place in postsecondary education. Their programs, especially the technical-vocational programs, have seen extraordinary growth in size, magnitude of mission, and complexity in the past twenty-five years (Parnell, 1990; Roueche, Baker, & Rose, 1989; Seagren et al., 1994). What changes have occurred that provide an impetus for looking at the community college technical-vocational dean and their leadership styles?

Educational reforms of the 1980s and 1990s have influenced the community college more than any other educational institution. From *A Nation at Risk* (National Commission on Excellence in Education, 1983), state laws implementing assessment programs and reforms, *America's Choice: High Skills or Low Wages?* (Commission on the Study of the American Workforce, 1990), *Tech Prep Associate Degree: A Win/Win Experience* (Parnell, 1990), reauthorization of the Perkins Act in 1990 and 1996, *Secretary's Commission on Achieving Necessary Skills* (SCANS, 1991), Goals 2000:

Educate America Act (1994), to the School-to-Work Opportunities Act (1994), the community college technical-vocational division has answered these calls for reform in restructuring workforce education. The community college is the institution that is a vital link to creating partnerships with high schools, universities and colleges, communities, governmental agencies, and business or industry. Furthermore, many of these partnerships are initiated and developed through the technical-vocational division of community colleges.

A large amount of literature on leadership centers on chief executive officers of businesses, administrators and presidents, academic deans, and department chairs of community colleges, universities, and four-year colleges. There is only a small amount of literature exclusively on the community college technical-vocational deans or chairs. Generally acknowledged is that the leadership of the community college chief executive officer sets the tone and pace for the administration of the community college. However, the technical-vocational dean has had to support these educational reforms with effective leadership. Bass (1996) lends advocacy to study leadership through his statement, "In the ongoing organization or society, understanding of the leader's behavior requires examining a stream of causality. The effective leader is transformational or transactional as conditions' change" (p. 53). Viewing the vocational-technical dean's leadership style and the impact on the faculty outcome of satisfaction, willingness to exert extra effort, and perceived dean effectiveness has implications for administrators in providing leadership continuity.

Leadership and followership are dependent upon each other. Roueche, Baker, and Rose (1989) state that transformational leaders empower the followers with leadership roles. Yammarino (1994) contends that transformational leadership facilitates followers from concerns of the immediate to concerns for growth. Examining the relationship of leadership of the technical-vocational dean and their faculty will begin a base of knowledge for this population.

Significance of Study

The findings from this study may be useful for predicting leadership practices that affect faculty outcomes. Moreover, this project tests Bass and Avolio's (1995) Full Range of Leadership model. With a national perspective, it will be the beginning of a knowledge base on technical-vocational deans and their faculty. Although the Seagren et al. (1994) study looked at all academic and technical-vocational deans and chairpersons of community colleges, they did not look at leadership styles and their relationship to selected faculty outcomes. With the importance of the technical-vocational dean's position and the need to identify potential leaders to fill the approximately 40% of anticipated positions due to retirement in the twenty-first century, this position should be a major focus for leadership development in community colleges (Seagren et al., 1994).

Assumptions

The first assumption is that leadership style is important in selecting new deans. A second assumption is that leadership style is associated with faculty outcomes. The third assumption is that a leadership model can be developed.

Delimitations of the Study

This study only applies to the role of the technical-vocational dean in single campus community colleges. Controlling for only three of the intervening variables further narrowed the study's focus. Other variables excluded from this study will be the supervisors' perceptions and students' perceptions of role performance. The theoretical framework of the Full Range Leadership model provided by Bass and Avolio (1995), and measured by the MLQ-Form 5X-Short, studies three subscale factors with nine indicators for the leadership styles and may ignore other leadership practices that may more fully explain the relationship between leadership style of the dean and at least three selected faculty.

Limitations of the Study

Because this study will focuses only on technical-vocational deans in single campus community colleges, its generalizability is limited to the single campus technical-vocational deans and their faculty members. Perceptions of the dean and faculty may not be accurate, resulting in a second limitation. Other variables not studied may be more important than the ones chosen for this study. The self-report format of the questionnaire and the MLQ-Form 5X-Short Leader and Rater Forms pose the problem of

honesty in reporting attitude. Additionally, the raters chosen at the institution to complete the Rater Form could bias the results.

Definition of Terms

Since many titles exist (AACC, 1996-1997) for leadership of the technical-vocational division, the technical-vocational dean was defined in this study as the individual with direct responsibility of supervising the technical-vocational faculty.

While many definitions of leadership prevail (Stogdill, 1975), Bass' definition of leadership is used in this study. This definition " . . . delineates effective leadership as the interaction among members of a group that initiates and maintains improved expectations and the competence of the group to solve problems or to attain goals" (Bass, 1990, p. 20).

The factors in the Multifactor Leadership Questionnaire (MLQ) have "maintained almost the same structure in various replications of the original factor analyses" (Bass & Avolio, 1991, 1997, p. 34) and are included in the definitions below.

Dean--one who is the direct leader of the faculty; other names include chairperson, director, coordinator, vice-president

Leader--anyone in direct supervision of the technical-vocational faculty with the title of dean, chairperson, director, coordinator, vice-president

Leadership style factors--factors that define transformational, transactional, and nontransactional leadership

Faculty outcomes factors--factors that define satisfaction, willingness to exert extra effort, and perceived leader effectiveness

Selected background variables--gender, time served in dean's position, and highest degree attained

Structural equation modeling--comprehensive statistical method to test relationships between observed and latent variables; involves a confirmatory factor analysis and then a path analysis

Transformational leadership--a process in which the leaders take actions to try to increase their associates' awareness of what is right and important, to raise their associates' motivational maturity and to move their associates to go beyond the associates' own self-interests for the good of the group, the organization, or society (Bass & Avolio, p. 11, 1997).

Idealized Influence (Attributed)--the component that sees charismatic leadership as an impact on followers or an attribution.

Idealized Influence (Behavior)--the component connected with the behavior of the charismatic leader.

Inspirational Motivation--viewed as the component where the transformational leader motivates and inspires followers by providing meaning and challenge to their work.

Intellectual Stimulation--the stimulation provided by the transformational leader to the followers to be innovative and creative by questioning assumptions, reframing problems, and approaching old situations in new ways

Individualized Consideration--the component associated with the transformational leader's attention to each individual followers needs for achievement and growth by acting as a mentor.

Transactional leadership--a process of gaining compliance from associates through explicit or implicit contracts with the leader (Bass & Avolio, 1997, p. 14).

Contingent Rewards--a component of transactional leadership where a constructive transaction or reward is used to motivate followers.

Management-by-Exception-Active--a component of transactional leadership where the follower is actively monitored and correction is provided as needed.

Management-by-Exception-Passive--viewed as a component where the leader waits passively for follower errors or deviancies and then takes corrective action.

Nontransactional leadership--a process of negating leadership when one avoids taking a stand on issues, avoids clarifying expectations, and avoids addressing conflicts (Bass & Avolio, 1997, p. 15); also, known as Laissez-faire leadership.

Laissez-faire--represents a nontransaction and is the avoidance or absence of leadership.

Satisfaction--reflects how satisfied both leader and associates are with the leader's style and methods, as well as how satisfied they are overall with the leader (Bass & Avolio, 1997, pp. 34-37).

Willingness to exert extra effort--reflects the extent to which associates exert effort beyond the ordinary as a consequence of the leadership (Bass & Avolio, 1997, pp. 34-37).

Perceived dean effectiveness--reflects the extent to which associates exert effort beyond the ordinary as a consequence of the leadership (Bass & Avolio, pp. 34-37, 1997).

Latent variables--hypothetical factors that cannot be directly observed.

Stakeholder--a category of people who have an investment in the organization and its success

Preview of Chapters

Chapter II presents a summary of the literature relevant to the community college technical-vocational division and the Full Range of Leadership model. Chapter III explains in detail the methodology used to implement the study. Information on sampling, data collection, and structural equation modeling is available in Chapter III. Chapter IV describes the empirical findings of this research. Facts and important data are presented in Chapter IV. Chapter V is where the researcher explicates the results, draws conclusions, discusses the implications of the findings, and gives recommendations for future study and consideration.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The purpose of this chapter is to critically examine the literature on (1) the background of technical-vocational education in American public community colleges, (2) an overview of the technical-vocational dean's role, (3) findings from the Seagren et al. (1994) study, (4) the full range model of leadership, and (5) the impact of the variables defining the subgroups of this research study.

Background of Vocational-Technical Education in the American Public Community College

In the first quarter of the twentieth century, communities across America acted to establish public community (junior) colleges. At first, the growth of the vocational programs in these institutions was slow (Gilli, 1976). Cohen and Brawer (1996) and Gilli (1976) give several reasons for the slow growth of vocational programs prior to 1960.

One reason involved the association of most junior colleges with public high schools in the early part of the century. Connected to this linkage was the lack of clarity for public school vocational education administration (Payne, 1924). This lack of clarity was attributed to the abundance of terminology associated with vocational education. Payne (1924) classified approximately thirty-five terms between those used within the public schools and those used outside the public schools. For all the discussion in this early vocational classification, Payne (1924) did not mention the public junior college.

Payne (1924) noted other reasons for the growth of public junior colleges which included the emphasis on the terminal nature of vocational education; costs to establish vocational programs; lack of employer demand for postsecondary experience; and the size of the junior college. National organizations began to advocate for the establishment of terminal occupational studies and these calls were largely unheeded by educational institutions (Eells, 1941b). The American Association of Junior College made these calls (AAJC) which ultimately resulted in the organization of the 1939 Commission on Junior College Terminal Education. This commission conducted a study in 1940 and published the results in three monographs. The third monograph (Eells, 1941c) supported the demand for terminal (vocational) education in the public junior colleges. In addition, these calls were echoed in the National Education Association's (NEA)1944 report, *Education for All American Youth*, and a 1947 recommendation by the President's Commission on Higher Education.

Other organizations influential to vocational education had their beginnings early in the twentieth century. This early support and impact were first given to the high school vocational programs and later extended to the public community colleges. One influential group in the vocational (practical studies) movement, called the National Society for the Promotion of Industrial Education (NSPIE), was founded in 1906 (Gordon, 1999). According to Gordon (1999), this group wanted the linkage of school to employment. NSPIE later became the Society for Vocational Education and in 1925 merged with the Vocational Association of the Middle West to form the American Vocational Association (Gordon, 1999). During this early part of the century, the

creation of the Vocational Division of the United States Office of Education broadened the focus for vocational education. Similarly, state vocational educational divisions were formed concentrating on the public high school vocational programs.

Federal legislation has consolidated vocational education through either funding or providing frameworks for vocational education. Gordon (1999) concisely states the impact of and changing emphasis of this federal support provided for vocational education.

> Federal legislation directing this funding has evolved through the years to reflect the needs of students, the changing economy, and the diversification of the workforce. At times, more national activities have been needed to determine how needs are changing. At other times, greater emphasis has been placed on the needs of states and localities to address growing student populations, the need to infuse new technologies into the classroom, or other demands of local business and industry to meet workforce needs. (p. 83)

A listing of important twentieth century federal legislation for vocational education is in Appendix A.

Struggling for a place and recognition in the junior college movement for approximately sixty years, vocational education had a notable expansion in the 1960s. This increase was due to the federal money made available with the passage of the 1963 Vocational Education Act. These monies augmented federal funds appropriated under the 1917 Smith-Hughes Act and the 1937 George-Deen Act. Gordon (1999) states that the 1917 Smith-Hughes Act was for high schools. However, the 1939 Commission on Terminal Education found that sixty-two junior colleges in fourteen states received federal funds from the 1917 Smith-Hughes Act and the 1937 George-Deen Act. Eells (1941b) contends the difference was in the application of the interpretation of "less than

college grade" to the curricula, not the institution (p. 29). Approximately ten federal acts in the 1960s provided impetus to the growth of vocational programs in the public community colleges. During the 1960s, the number of public community colleges increased 49%, while the enrollment more than doubled (Cohen & Brawer, 1996). At the end of the 1970s, more than 60% of all public community college graduates received vocational-technical degrees (Witt, Wattenbarger, Gollattscheck, & Suppiger, 1994, p. 249).

Federal legislative support continued in the 1970s with approximately eight federal acts or amendments. A small number of acts and amendments followed this in the 1980s. There was a strong reappearance of federal legislative support in the 1990s with approximately nine acts, authorizations, reauthorizations, or amendments.

The Carl D. Perkins Vocational Education Act of 1984 and subsequent amendments, acts, or reauthorizations in 1990, 1993, and 1998 continued to provide significant amounts of federal money to technical-vocational education. With this money and coupled with an increased awareness among Americans as to the levels of education necessary for quality employment opportunities, the vocational program's growth stabilized in the early 1990s (Cohen & Brawer, 1996).

Not only did the Carl D. Perkins Vocational Education Act of 1984 and its subsequent amendments, acts, or reauthorizations provide money, the act provided a broad-based single definition for vocational education. The Carl D. Perkins Vocational Education Act of 1984 defined vocational-technical education as organized educational programs offering sequences of courses directly related to preparing individuals for paid

or unpaid employment in current or emerging occupations requiring other than a baccalaureate or advanced degree. Additionally, the act provided support for leadership development and leadership research (American Vocational Association Guide, 1990).

With this definition of vocational education, support for leadership development in vocational education, and faced with a combined force of societal and workforce changes, both America and technical-vocational education must continue to respond appropriately to provide for the nation's workforce. Even the 1939 Commission on Junior College Terminal Education was concerned with the ever-changing social, economic, and educational factors. Eells (1941c) devoted entire chapters in the third monograph to these topics. Current challenges, as we begin a new century, include an aging population, multicultural diversity, a greater need for advanced technological skills, work sites that want collaborative work teams, and rapid technological advances in the workplace. The long-range goal of the Carl D. Perkins Act regarding leadership development and leadership research is to increase the number of and quality of leaders to meet the challenges facing vocational education. These challenges will need exceptional leadership as we begin the twenty-first century.

Role of the Technical-Vocational Dean

This study defined the technical-vocational dean as the person who is the direct leader of the technical-vocational faculty. Other titles for this person include chairperson, director, coordinator, or vice-president. Cohen and Brawer (1996) note that attempting a description of the model administrative organization in the community

college is futile. Dependent upon the size of the institution, several models could occur. However, it is agreed that a designated dean or division chairperson is the direct leader of the faculty (Cohen & Brawer, 1996; Gilli, 1976; Hammons, 1984; Seagren et al., 1994). Even though Blocker, Plummer, and Richardson (1965) recommended an organizational chart, it was for the larger community colleges. The structure remains variable and inconsistent among community colleges. Single campus community colleges usually have a more horizontal administrative organization than multi-campus community colleges. Normally, there will only be one or a very small number of faculty in each of the various departments. Thus, a dean (or chairperson, director, coordinator) would lead a small division or department of all the technical-vocational faculty at single campus community colleges. Without an accepted template and common naming schema for the administrative structure of single campus public community colleges, the researcher chose the title of technical-vocational dean for this study.

The Seagren et al. (1994) study included both vocational-technical program chairs and liberal arts and science chairs. The responsibilities of these chairpersons in the community college are stated below by Seagren et al. (1994).

> Chairs have regular contact with administrators, faculty and students. They oversee the department or division's daily operations. They negotiate among unit goals, individual staff goals, and institutional goals. They participate in key decisions, and have authority and responsibility for decisions about students, curriculum, budget, and staffing. (p. 5)

The department chairperson is often seen as the position largely responsible for the department quality and process (Seagren et al., 1994). Furthermore, it is the position that encounters faculty matters without appropriate training (Cohen & Brawer, 1996).

There are similarities between the job functions of a technical-vocational deans and liberal arts and science chairs in the single campus community college. The similarities relate to the routine, day-to-day aspects of responsibilities related to finances, facilities, faculty, staff, and students. The differences between the two are connected to the regional distinctiveness of the technical-vocational programs and the sources of federal funding specifically for technical-vocational education. Additionally, scheduling for longer applied class times, managing the larger facilities that house equipment for the applied class times, and managing larger budgets set the technical-vocational division apart from the academic transfer division. Furthermore, a faculty whose background experience is business and industry rather than education presents another unique element.

Another differentiating element from the academic transfer deans is the responsibility technical-vocational deans have for initiating and maintaining contact with regional business and industry. Cohen and Brawer (1996), say that the "college staff presumably initiate programs by perusing employment trends in the local area and by surveying employers there. Program coordinators are appointed and advisory committees composed of trade and employer representatives are established" (p. 228).

Supporting the role of the technical-vocational dean in need for external contacts are educational reforms. Educational reforms of the 1980s and 1990s have impacted the community college and the technical-vocational division more than any other educational division or institution. From *A Nation at Risk* (National Commission on Excellence in Education 1983), state laws implementing assessment programs and reforms, *America's*

Choice: High Skills or Low Wages? (Commission on the Study of the American Workforce, 1990), *Tech Prep Associate Degree: A Win/Win Experience* (Parnell, 1990), reauthorization of the Perkins Act in 1990 and 1996, *Secretary's Commission on Achieving Necessary Skills* (SCANS, 1991), Goals 2000: Educate America Act (1994), to the School to Work Opportunities Act (1994), the community college technical-vocational division has answered these calls for reform in restructuring workforce education.

Another widely accepted discriminating factor between a four-year postsecondary institution and a community college is the latter's ability to quickly respond to changes for workforce training. Goldenberg (1990) suggests that the ability to change rapidly and in direct response to client demand has set the community college in a unique leadership position within the wave of postsecondary educational reform. Community colleges have experienced unprecedented growth and support from both community groups and business and industry, particularly with respect to their important role in providing mid-career job training (Seagren et al., 1994).

Within the community college, the technical-vocational programs provide this rapid response. The technical-vocational dean is normally the person who works with the businesses and industries, the advisory committees, local civic and governing entities, the faculty, and the students in the issues of a quickly changing workplace and society.

Cascio (1995) suggests that, with the globalization of markets, the increasing diversity of workforces, and the emphasis on time as a critical element in an organization's ability to compete, the need for developing transformational leadership

skills and competencies has never been greater. With the community colleges ability to answer training needs for businesses and industries quickly, coupled with the partnerships that arise naturally from this supply and demand for trained workers, the technical-vocational deans need for leadership skills and identification of competencies is also in high demand. Seagren et al. (1994) states " . . . the chair must have the skills and be prepared to work in the external environment building relationships with business, industry, and community leaders" (p. 49).

While the responsibilities and activities of department chairpersons are well-documented (Hammons, 1984; Lombardi, 1974; Winner, 1989), an extensive study of the department chair's leadership style was lacking in the literature. Seagren, Wheeler, Creswell, Miller, VanHorn-Grassmeyer (1994) conducted a successful study of the community college chairs. The study provided a national profile of community college chairs, implications for leadership development, institutional commitment, and recommendations for future research. However, there remains scant literature for the leadership style for the community college technical-vocational deans (chairs) population. Only the Seagren et al. (1994) items that have relevance to this study will be discussed below.

Selected Findings from the Seagren et al. (1994) Study

Characteristics of the chairs include age, gender, ethnicity, highest degree obtained, present position, number of years in their position, experience working in business or industry, salary, and future plans. Nearly, 47% were in the 45-54 years of

age category. Nearly, 60% were male and approximately 89% of the respondents were Caucasian. Also, about 59% held a master's degree, while more than 23% held a doctorate. Over 64% held the title of chair and 12.3% had the title coordinator/director. Only 3.5% held the title assistant/associate dean. For this position, 44.8% had between one and five years of experience, 26.2% had six to ten years experience, and 14.8% had between eleven and fifteen years experience, and nearly 13% had more than sixteen years of experience in their current position. In terms of experience working in business or industry, 65.4% had experience in business or industry. The average salary was between $41,000 and $60,000 with 55.6% of the chairs responding in this category. Nearly 30% of the chairs reported their salary as between $21,000 and $40,000. Over 14% made $61,000 or above. More than 73% reported their plans as staying at the same community college while more than 13% plan to retire.

More than 80% of the chairs saw their role as a planner, motivator, information disseminator, facilitator, advocate, visionary, conflict resolver, delegator, mentor, resource allocator, and evaluator. And 92% said their role was to encourage the professional development of each staff member and more than 97% saw their role as to create a positive environment. About 71% saw their role as developing relationships with business and community groups and 69% said their role was to manage facilities and equipment. Interestingly, only 40% saw their role involved with seeking external funding.

Skills necessary for the effective chair were rated by over 96% as very important or important. These were sensitivity, judgement, organizational ability, leadership,

decisiveness, written and oral communication, stress tolerance, educational values, and problem analysis. Personal motivation of the faculty was rated important by 83.9% of the chairs and 74.1% rated as important the ability to discuss a variety of societal issues.

Challenges the chair agreed they must address in the next five years include only 59.6% for increasing the use of business and industry advisory committees and 38.9% for increasing teaching programs sponsored by specific companies.

The community college provides a rapid response to educational reforms and also to area business and industry needs. This ability to respond quickly and the additional findings in the Seagren et al. (1994) study indicate a need to examine the leadership of the community college technical-vocational dean. Under the leadership of the technical-vocational dean, the technical-vocational division is largely responsible for this rapid response. This study found response differences in chairpersons perspectives' of job dimensions. These differences in responses were directly related to the chairpersons' program area (Seagren et al., 1994). Liberal arts and science's chairperson's responses to items related to technical-vocational education were more likely to disagree with the items or see them as unimportant items (pp. 108-109). These items are related to preparing a workforce, advisory committees for curriculum direction, and external contacts, all of which are important to the technical-vocational programs.

Seagren et al. (1994) identified implications for leadership development. Among the major implications is leadership training for the majority of positions that will need to be filled within the next twenty years. Expanding the diversity of chairs by recruiting and retaining those individuals of minority ethnicity and gender, is needed. The chair

should have the skills necessary to work with business, industry, and with community entities. Opportunities for growth in the intrapersonal skills, interpersonal skills, developing a vision, and communication of these skills and vision was identified as needed by the chairs. Institutional commitment to the chairs leadership development is closely aligned with the implications for leadership development given in the preceding paragraph. Other institutional commitment suggestions given by the Seagren et al. (1994) study the researcher deemed important to this study include the effective use of advisory committees. Also growth opportunities should be provided for chairs facilitation skills, communication skills, listening skills, and developing the visionary role. Another area for institutional commitment is to encourage chairs to seek external funding. Identification of and early leadership training for potential chairs who are female and/or ethnic minorities are needed. Seagren et al. (1994) identified an institutional commitment that provided part of the impetus for this study and it is to ". . . encourage and provide opportunities to develop transformational leadership (Bass & Avolio, 1993) . . . " (p. 122).

Seagren et al. (1994) also provided suggestions for future research which were incorporated into the present study. Those suggestions were to research how the faculty views the leadership ability of the chair. Another suggestion was to determine the most prevalent type of leadership and the most effective type of leadership. The study presented here addressed these suggested areas of future research.

Full Range Model of Leadership

Leadership

Leadership is an elusive idea that has many definitions (Owens, 1991; Stogdill, 1975; Yukl, 1989). Leadership literature has evolved from simple lists of the job duties to interesting theories. What differentiates technical-vocational deans who can lead from those who cannot lead? Some technical-vocational deans are clearly more effective leaders than others. Faced with societal and workforce changes along with the implications noted above from the Seagren et al. (1994) study, research of the technical-vocational deans' leadership style is needed. For vocational education to change in response to these societal shifts and demands, vocational educational leadership must reflect these changes (Moss, Finch, & Johansen, 1991). Thus, effective leadership provided by the local vocational administrator is crucial to the successful implementation of educational change (Moss et al., 1991). Leadership is important in the framework of workforce education and is the community college technical-vocational dean's major responsibility.

Presidents are often thought of as the educational leader (Roueche, Baker, & Rose, 1989). Although in reality, the president's main efforts are centered on being a good manager, an effective state-level spokesperson, and a fund raiser. Gilli (1976) acknowledges that this means workforce leadership in the community college must be lodged in another position (p. 121). Community college technical-vocational deans have responsibilities that involve using leadership skills and management skills to build work force educational opportunities. Those skills, noted in Seagren et al. (1994) study, are

planner, motivator, information disseminator, facilitator, advocate, visionary, conflict resolver, delegator, mentor, resource allocator, encourager, and evaluator.

A large amount of the literature on leadership centers on: (1) chief executive officers of businesses, and (2) administrators and presidents, academic deans, and department chairs of community colleges, universities, and four-year colleges. Moss and colleagues, for example, published a series of studies around leadership of vocational administrators and vocational educators. Examples of this body of work include measurement development (Moss & Jensrud, 1995), theory development (Moss, Finch, & Johansen, 1991), and empirical results (Moss & Jensrud, 1995; Hopkins, Lambrecht, Moss, & Finch, 1998). Research and training programs to enhance vocational leadership abilities have included *Training and Development Programs for Vocational Education Personnel* (PL 94-482) and work by the National Center for Research in Vocational Education (NCRVE). The majority of this work has been directed toward public school vocational education.

Bass (1996) further supported the need to examine the technical-vocational dean's leadership, "In the ongoing organization or society, understanding of the leader's behavior requires examining a stream of causality. The effective leader is transformational or transactional as conditions' change" (p. 53). Bennis and Nanus (1985) stated "Effective leadership can move organizations from current to future states, create visions of potential opportunities for organizations, instill within employees commitment to change and instill new cultures and strategies in organizations that mobilize and focus energy and resources" (p. 17). Especially during times of change or

reform, administrators who successfully lead others often possess attributes associated with transformational leadership (Finch, Faulkner, & Gregson, 1993; Van Ebron & Burke, 1992).

Together, transformational leadership, transactional leadership, and nontransactional leadership, major leadership constructs, and outcomes of effectiveness, satisfaction, and extra effort form a new leadership model. This leadership model discriminates between lower-order and higher-order effects of leadership style and can examine more complex leadership models. Bass and Avolio (1997) call this new model the Full Range of Leadership Model.

Transformational Leadership

The transformational leadership idea was first mentioned by Downton (1973), further developed by Burns (1978), and was elaborated on by Bennis and Nanus (1985). In 1985, Bass refined this theory of leadership. Bass and Avolio (1994) "presented a formal theory of transformational leadership as well as models and measurements of its factors of leadership behavior" (p. 2). Burns (1978) saw transformational and transactional leadership acting at opposite ends of the leadership range. In contrast, Bass and Avolio (1989) make the argument that a transformational leader enhances transactional leadership. Bass and Avolio (1990) have defined this recent leadership paradigm as one in which "the need to promote change and to deal with resistance to it has, in turn, led to an emphasis on democratic, participative, relations-oriented, and considerate leadership" (p. 11).

Bass and Avolio (1997) see transformational leadership as an augmentation of transactional leadership. The indicators of the factor of the transformational leadership style include Idealized Attributes, Idealized Behaviors, Inspirational Motivation, Intellectual Stimulation, and Individualized Consideration.

Idealized Attributes involves showing respect, trust, confidence toward the leader and supporting their vision. Employees often model themselves after these leaders. Idealized Behaviors are the behaviors that the leader demonstrates in being a role model. They are the behaviors that elicit the followers' respect, trust, confidence, and visionary support. Inspirational Motivation means communicating a vision with confidence and increasing optimism and enthusiasm in attaining that vision. Intellectual Stimulation is defined as actively encouraging employees to question the status quo and to examine their own and others' assumptions and beliefs. Individual Consideration is expressed as personalized attention to the needs of every employee, making each feel valued, treating employees differently but equitably based on their needs. A technical-vocational dean whose leadership style is transformational may draw upon one or more of the five behaviors.

Persons who model the transformational leader are willing to put the vision and goals of the organization as a whole above their own personal desires. The transformational leader encourages and cultivates the employee's development where they feel like an important and valuable employee. The transformational leader listens to ideas and thoughts of individuals throughout the organization and maintains open lines of

communication. Transformational leaders create change while "transactional leaders tend to work within the system to preserve the status quo" (Silins, 1992, p. 319).

The study of transformational and transactional leadership is quite extensive in the areas of business and the military, but limited in education and especially in vocational education. The large majority of empirical work on outstanding leadership has been conducted within the transformational leadership framework by Bass (1985) and his colleagues. The transformational and transactional leadership models (Bass, 1985, 1990) have a number of implications for vocational education. According to theory, current and future changes are more effectively implemented when leaders exhibit transformational leadership behaviors (Finch, Gregson, & Faulkner, 1991; Van Ebron & Burke, 1992).

Research on the transformational leadership paradigm has proven to be rather promising. For example, Bryman (1992) cites a variety of organizational studies demonstrating that transformational leader behaviors are positively related to employees' satisfaction, self-reported effort, and job performance. Similar results have been reported in several field studies (Avolio & Bass, 1988; Bass, Avolio & Goodheim, 1987; Bass, Waldman, Avolio, & Bebb, 1987; Bennis & Nanus, 1985; Conger & Kanungo, 1987; House, Spangler, & Woycke, 1991; House, Woycke, & Fodor, 1988; Trice & Beyer, 1986), from a variety of samples and organizational settings.

Transactional Leadership

Leadership has often been viewed as an exchange process. The leader provides rewards to employees in the form of pay or prestige in exchange for work done by

employees. Burns (1978) labeled this type of leadership behavior as transactional leadership. A third form of leadership presented by Bass and Avolio (1990) is laissez-faire or non-leadership. According to Bass and Avolio (1994), the laissez-faire leader avoids leadership by not interacting with followers. Laissez-faire leaders are ineffective. Bass and Avolio (1990) state that "decisions are often delayed; feedback, rewards, and involvement are absent; and there is no attempt to motivate followers or to recognize and satisfy their needs" (p. 20).

According to Burns (1978), transactional leaders motivate workers by providing rewards which appeal to the workers' self-interest. However, Burns (1978) argues that this relationship is not permanent since the leader and the follower are not working together toward a mutual goal.

Transactional leadership works more effectively when organizations (school systems) are operating under more stable or settled conditions (Mitchell & Tucker, 1992; Van Ebron & Burke, 1992). Transactional leadership focuses on contingent reinforcement including positive contingent reward and negative management-by-exception (Bass & Avolio, 1994). The indicators associated with the transactional type of leadership includes Contingent Reward, which is a constructive form, and Management-by-Exception (both passive and active), which is a corrective form. A nonleadership style that is at the lowest end of the continuum of leadership behaviors is known as Laissez-Faire. Contingent Reward is a proactive goal setting strategy to establish the expectations for the employees and what the workers will get for their achievement. Management-by-Exception Active appraises performance for mistakes and takes action

to correct the performance. Employees with this type of a leader will be more traditional than innovative and not perform at a high level. In contrast, Management-by-Exception Passive leaders do not look for mistakes. These leaders will wait to take action until the problem is forwarded to their attention. Laissez-Faire leadership is an avoidance of leadership.

Outcomes of Leadership

From the descriptions of transformational and transactional leadership factors, these factors and their indicators are related to the success of the followers. Bass and Avolio (1997) state that the outcomes of leadership and the leaders' success is related to the followers' perceptions of the leader. Bass and Avolio (1995) state that this perception is determined by: (1) how often the followers perceive their leader as elevating them to higher levels of extra effort, (2) how the followers perceive their leader as being effective, and (3) how satisfied the followers are with the way their leader works with others (p. 37). These indicators of extra effort, effectiveness, and satisfaction are associated with the factor of outcomes in the Full Range Leadership Model.

Relationship of Transformational Leadership and Followership

Burns (1978) described actions of leaders and their effects on followers. Bass (1985) described leaders' characteristics and behavior on followers. According to Bass and Avolio (1997), transformational leaders influence employees to perform beyond expectations by cultivating, intellectually stimulating, and causing them to work toward a

mutual purpose or vision. Although Van Ebron and Burke (1992) and Burns (1978) stated that a leader relates to followers as either a transformational or transactional leader, research has indicated that leaders often use a combination of transactional and transformational leadership behaviors (Bass, 1985; Bass & Avolio, 1990; Moss, et al., 1996).

The term stakeholder has taken on great importance in current change initiatives. There are many internal and external stakeholder groups involved with the community college technical-vocational programs. Within the region the community college serves, these stakeholder groups include government and civic agencies and groups, businesses, industries, apprenticeships, school-to-work programs, prison programs, regulatory agencies, and public school vocational programs. Many of these individuals serve on various technical-vocational program advisory committees. These stakeholders have considerable interaction and investment into the technical-vocational programs at their local community college. Thus, they have considerable interaction with the technical-vocational dean at their local community college. The transformational leader attempts to raise the stakes for all who are involved with the technical-vocational programs.

Selected Variables for the Study

Leadership and Gender

This study contributes to the body of knowledge about effective leadership of male and female technical-vocational community college deans in relation to the theory of transformational leadership (Bass, 1985, 1990; Bass & Avolio, 1990, 1994). This

study addresses leadership effectiveness of these vocational administrators as a function of gender and leadership style. Significant changes are occurring in vocational education and in turn affect the vocational administrator's role.

One of these changes is the increase in the number of women in leadership positions. Bass (1996) states that "women leaders appear to display qualities more in line with transformational leadership" (p. 88). Reports by Rosener (1990), Gilligan (1982), Helgesen (1990), and Eagly and Johnson (1990) have led to the conclusion that women and men have differing leadership styles and revision of the view that both lead in the same way is needed. Seagren et al. (1994) suggest that gender influenced chairs responses in approximately 86% of the clusters of roles studied.

Research by Rosenor (1990) states that where men tend to describe themselves by the components of transactional leadership, women describe themselves by components of transformational leadership. In contrast, Gillett-Karam (1989) found few major differences between men and women on dimensions of leadership behavior. Therefore, it is essential that values and qualities of gender be explored.

Leadership and Type of Institution

Tucker (1992) indicates that departmental size and institutional size seem to influence how academic chairpersons set priorities and make decisions. Why study the single campus community college? While technical-vocational educational systems at single campus and multicampus community colleges may appear to be quite different, they are nevertheless based upon the same fundamental principles. However, the

functions and responsibilities of the dean of vocational education and the ease with which the dean discharges them, are almost entirely dependent upon the type of community college of which they are a part. At multicampus community colleges, the technical-vocational dean may have a staff of chairpersons, with their activities restricted to the organization and administration of their various programs of vocational education. These deans may have less interaction with their faculty. On single campus community colleges, the dean may be more closely aligned with their faculty and with the community in general.

Regardless the size of the institution, the same principles apply for every dean of technical-vocational education. The person serving as dean has been delegated the responsibility, authority and powers and responsible for results by the president or a committee reporting to the president of a community college.

Leadership and Tenure

The number of years experience in the current position and the years of experience in business and industry merits attention in this research study. Prior administrative experience in a technical-vocational setting and prior experience in business and industry had implications in the Seagren et al. (1994) study. The results for those who had prior administrative experience suggest that this experience enhances "...chairs' perspectives about the importance of a variety of their job dimensions, and the necessity of their leadership with respect to a myriad of matters" (Seagren et al., 1994, p. 105).

Seagren et al. (1994) results for those with prior experience in business and industry indicate they "...see the need for processes and strategies around planning, leadership, faculty development and external responsiveness. Such foci may result in programs with greater external and curricular relevance" (p. 106).

Although Cimperman (1986) found few real differences in leadership styles of Wisconsin community college leaders with varied backgrounds, the length of time served as a leader may reflect a difference. Larwood and Wood (1977) further support the impact of time on leadership in noting that women generally differ from men in traits of concern to leadership. They also interpreted these gender differences as transitory evidence of women's relative lack of familiarity with the leadership tasks involved. Larwood and Wood (1977) additionally believe that with experience and societal change, these gender differences disappear.

CHAPTER III

METHODOLOGY

Introduction

The purpose of this study is to test the Full Range Leadership Model of leadership and to investigate whether community college technical-vocational deans' leadership styles impact faculty outcomes of satisfaction, willingness to exert extra effort, and perceived dean effectiveness. This chapter is dedicated to a discussion of the methods and procedures used in the study. Specific areas discussed include research design, instrumentation, sample selection, pilot study, collection of data, and data analysis.

Research Design

Prediction and relationship design will be used for this study to determine whether transformational, transactional, or a combination of these leadership styles impact follower outcomes of satisfaction, extra effort, and perceived dean effectiveness.

Instrumentation

The survey instrument for this study is Bass and Avolio (1995) Multifactor Leadership Questionnaire (MLQ) Form 5X--Short (Revised) and a demographic questionnaire. Two forms are available for use: Leader Form and Rater Form, each two pages in length. Bass and Avolio's Multifactor Leadership Questionnaire Form 5X--Short (Revised) were pages two and three in the survey instrument. Page four of the

survey instruments consisted of demographic questions. Each survey instruments' first page was descriptive with directions. This descriptive first page of each questionnaire, along with the demographic questionnaire, can be seen in Appendix B.

Bass and Avolio's Multifactor Leadership Questionnaire (MLQ) contains a broad range of leadership behaviors, from Laissez-Faire to Idealized Attributes leadership and also discriminates between ineffective and effective leaders. The MLQ places an emphasis on the development of leadership. The supporting research notes that leaders must develop themselves in order to effectively develop others (Bass & Avolio, 1997). The Rater Form offers a view of leadership styles from another organizational level. The MLQ is a means to "...systematically measure, explain, and demonstrate to individuals -- in behavioral terms -- what we have commonly thought of as exceptional or exemplary leadership behavior" (Bass & Avolio, 1997, p. 4-5). Multifactor Leadership Questionnaire scores can be used to identify candidates for leadership positions.

The MLQ has "45 items that identify and measure key leadership and effectiveness behaviors shown in prior research to be strongly linked with both individual and organizational success" (Bass & Avolio, 1997, p. 11). The nine leadership indicators comprising the Full Range of Leadership styles, are each measured by four items. Also, four items measure the follower outcome indicator of perceived leader effectiveness. Three items measure the follower outcome indicator of their willingness to exert extra effort, and two items measure the follower satisfaction indicator. Response anchors for the MLQ consist of a five-point scale in "a magnitude estimation-based ratio

of 4:3:2:1:0" (Bass & Avolio, 1997, p. 14). These response anchors for rating leadership behaviors range from *not at all (0)* to *frequently, if not always (4).*

Bass and Avolio (1995) revised the MLQ, Form 5R to the latest version, MLQ-Form 5X-Short, addressing concerns raised by Hunt (1991) and Yukl (1994), regarding psychometric problems with the earlier version. Additionally, they have refined the factor structure to address the complexity of leadership styles. According to Bass and Avolio (1997), the reliability for the Leader Form for each of the nine indicators, ranged from alpha reliability coefficients of .69 to .85. Test-retest reliabilities ranged from .44 to .74. For the Rater Form, Bass and Avolio (1997), reported alpha reliability coefficients of .74 to .94, for each of the nine indicators. Since test-retest reliabilities for the Rater Form ranged from .53 to .85, Bass and Avolio, (1997) recommend using the followers' ratings "for research purposes due to the higher reliabilities" (p. 54). In support of this recommendation, Bass and Avolio (1997) also found that "leaders tend to inflate their ratings in comparison to those received from associates" (p. 54).

Factors in the MLQ were conceptually and empirically derived and confirmed with two independently conducted factor analyses using the principal component's method with varimax rotation. The intercorrelations of the MLQ leadership factor scores showed that the transformational leadership factors were more highly correlated with each other than with transactional and Laissez-Faire leadership.

The correlations of the leadership factor scores and rated outcomes have been supported in studies and meta-analyses that demonstrate the validity of the Full Range of

Leadership Model (Bass & Avolio, 1997, p. 39). In addition, correlations have been obtained between the MLQ scales and cognitive and personality traits.

The MLQ measured transformational and transactional leadership style indicators, which were the independent variables in this study. These two leadership factors contain nine behavioral indicators. The study included intervening variables of gender; institutional size; length of time served in position, as faculty, and in business and industry; and highest degree held by the technical-vocational dean. Dependent variables were faculty satisfaction, faculty willingness to exert extra effort, and perceived dean effectiveness.

Demographic Questionnaires

Two demographic questionnaires were constructed. The questionnaires were employed to provide demographic data necessary for the study. Each questionnaire surveyed demographic characteristics of the deans and faculty, respectively. Those characteristics included current position and title, prior position and title, future professional plans, age, gender, ethnicity, size of institution, highest degree attained, length of time served as dean, length of time served as faculty, and length of time served in business and industry. The design of the questions on both questionnaires was closed-ended for a forced response and can be seen in Appendix B.

Scoring

Both versions of the MLQ measured the same items. The Leader Form and the Rater Form both measured corresponding items. The Leader Form was the deans' self-perception of the indicators: (1) idealized attributes; (2) idealized behaviors; (3) inspirational motivation; (4) intellectual stimulation; (5) individualized consideration; (6) contingent reward; (7) management-by-exception active; (8) management-by-exception passive; (9) laissez-faire; (10) faculty satisfaction; (11) faculty willingness to exert extra effort; and (12) faculty view of the dean's effectiveness. The Rater Form is the faculty's perception of their leader on the same indicators.

The five transformational leadership style indicators measured in the Leader Form and Rater Form include: (1) idealized attributes, (2) idealized behaviors, (3) inspirational motivation, (4) intellectual stimulation, and (5) individualized consideration. Each indicator was measured by four items.

The four transactional leadership indicators measured in the Leader Form and Rater Form include: (1) contingent rewards, (2) management-by-exception-active, (3) management-by-exception-passive, and (4) laissez-faire. Contingent reward, management-by-exception-active, management-by-exception-passive, and laissez-faire were each measured by four items.

The three outcome indicators measured in the Leader Form and Rater Forms are the faculty's: (1) willingness to exert extra effort, (2) perceived dean effectiveness, and (3) satisfaction. Three items measured extra effort and four items measured effectiveness. Two items measured satisfaction.

Population

The target population included 598 single campus American Association of Community Colleges (AACC) deans identified as directly responsible for the technical-vocational faculty at their institution. The lists provided by the AACC provided the campus president's name, title, institutional name, address, institution type, and 1995-1996 Integrated Post-secondary Educational Development (IPED) unduplicated head count, for an accurate description of the size of the institution.

Sample

The sample for this study consisted of 398 colleges randomly selected from the list provided by the American Association of Community Colleges.

Sampling Procedure

From the list provided by the American Association of Community Colleges, the single campus colleges were assigned a number. Using a table of random numbers, 398 single campus community colleges were selected. Results from this study were generalized to the target population that included 598 technical-vocational deans of single campus community colleges. Since a large sample size was needed, over sampling was used.

Data Collection

A letter was sent to the president of each community college in the sample requesting their endorsement and support of this study. Copies of the letters are in Appendix C. Additionally, they were asked to be the contact person for the distribution of the Leader and Rater questionnaires, explanatory letters, and individual postage-paid business reply return envelopes. This was done to ensure the anonymity and random selection of the faculty that completed the Rater Forms. An additional method employed to contribute to the anonymity of the faculty was the ability to fill out the questionnaires over the Internet at a http://address provided in the letter.

During November of 1998, 398 packets were mailed to the community college presidents of the random sample. Each packet consisted of one Leader survey instrument, five Rater survey instruments and a postage paid return envelope. The cover letter to the president explained the study and requested their support. Each survey instrument included a letter addressed either to the dean or to the faculty. Two reminder letters were mailed, one in December and another in early January, to all non-respondents, requesting the return of the survey instruments.

In February, a letter was sent to the president of the community college in order to acquire complete sets of information from responding institutions. A copy of this letter can be seen in Appendix D. Each letter requested the information from each community college in the sample needed to complete institutional sets of data (i.e., one leader form and at least three faculty forms) according to the responses received by February. For this part of the data collection, e-mail and regular mail was utilized.

Data Analysis

Data were analyzed using the Full Structural Equation Model with the LISREL program (Jöreskog & Sörbom, 1996b). The full structural equation model encompasses both a measurement and a complete structural model (Anderson & Gerbing, 1988; Byrne, 1998; Kelloway, 1998; Mueller, 1996; & Schumacker & Lomax, 1996). From Multifactor Leadership theory (Bass & Avolio, 1993), a clear conceptualization of this model for this study is presented in Figure 3.1.

The structural part of the model represents the hypothesis that technical-vocational faculty outcomes of willingness to exert extra effort, perceived dean effectiveness, and satisfaction are derived the perception (self or rater) of the technical-vocational dean's transformational, transactional, or a combination of these leadership styles.

This analysis followed a two-step method recommended by Anderson and Gerbing (1988) and supported by other leaders in Structural Equation Modeling (Schumacker & Lomax, 1996; Kline, 1998; Kelloway, 1998; Tabachnick & Fidell, 1996; & Jöreskog & Sörbom, 1996b). A first-order confirmatory factor analysis was used to develop a measurement model that demonstrated an acceptable fit to the data. This initial measurement model is in Figure 3.2. Next, the measurement model was modified to represent the theoretical Multifactor Leadership model of interest in this study. This measurement model was tested and revised until a model was found that is both theoretically meaningful and statistically acceptable.

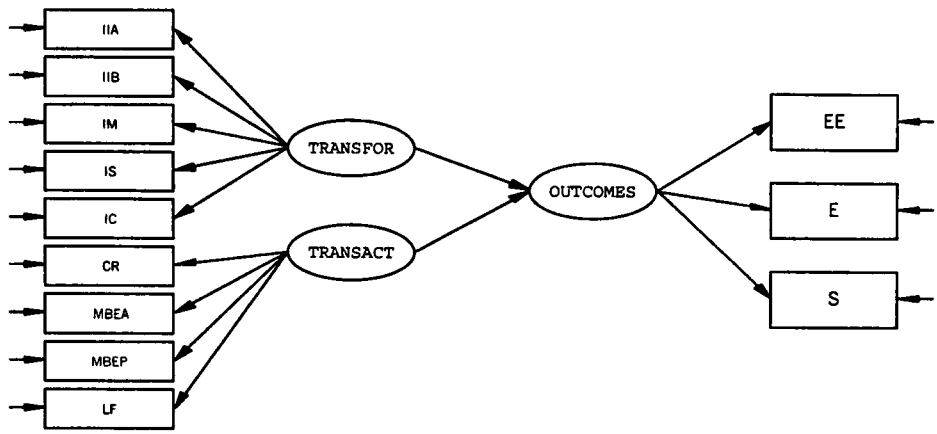

Figure 3.1 Theoretical MLQ-5X for the Full Range of Leadership Model

IIA - Idealized influence attributed
IIB - Idealized influence behavior
IM - Inspirational Motivation
IS - Intellectual Stimulation
IC - Individual Consideration
CR - Contingent Reward
EE - Extra Effort
S - Satisfaction
MBEA - Management-by-Exception Active
MBEP - Management-by-Exception Passive
LF - Laissez-faire
TRANSFOR - Transformational leadership
TRANSACT - Transactional leadership
OUTCOMES - Faculty outcomes
E - Effectiveness

In structural equation modeling with latent variables, this measurement model describes the essence of the relationship between the latent factors of transformational, transactional, and faculty outcomes and the manifest indicator variables that measured these latent variables. The latent factor of transformational leadership has five indicator variables while the latent factor of transactional leadership has four indicator variables. The latent factor of faculty outcomes has three indicator variables.

Significance of Study

The findings from this study may be useful for predicting leadership practices that affect faculty outcomes. Moreover, this project tests Bass and Avolio's (1995) Full Range of Leadership model. With a national perspective, it will be the beginning of a knowledge base on technical-vocational deans and their faculty. This study can help administrators identify potential leaders of the technical-vocational division, plan future leadership continuity, determine which criteria to incorporate in the selection process, and plan for future training.

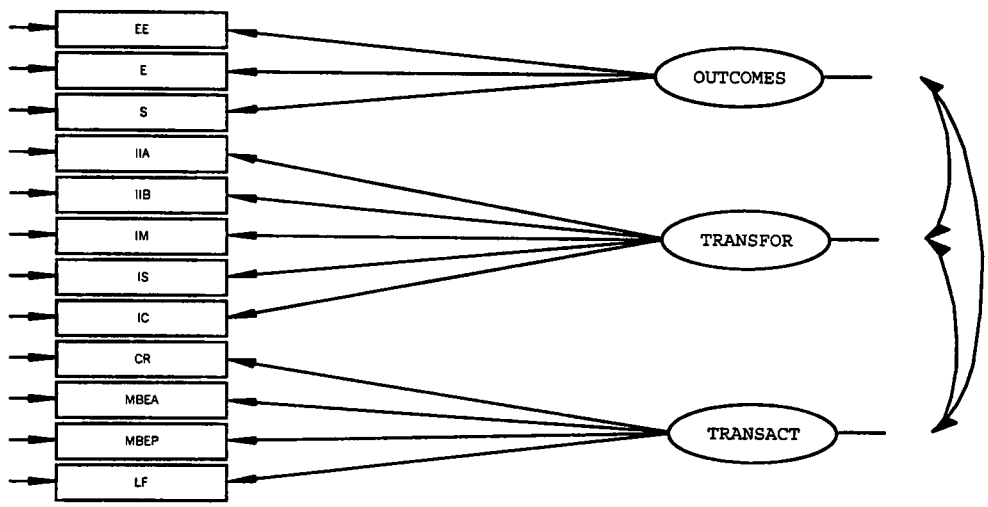

Figure 3.2 Initial Measurement Model

IIA - Idealized influence attributed
IIB - Idealized influence behavior
IM - Inspirational Motivation
IS - Intellectual Stimulation
IC - Individual Consideration
CR - Contingent Reward
EE - Extra Effort
S - Satisfaction
MBEA - Management-by-Exception Active
MBEP - Management-by-Exception Passive
LF - Laissez-faire
TRANSFOR - Transformational leadership
TRANSACT - Transactional leadership
OUTCOMES - Faculty outcomes
E - Effectiveness

Limitations of Methodology

The self-report format of the questionnaire and the MLQ-Form 5X-Short Leader and Rater Form pose the problem of honesty in reporting attitude. Additionally, the raters chosen at the institution to complete the Rater Form could bias the results. However, the sealed envelope provided for each individual can facilitate honesty in reporting. The percentage of returns will determine the practical, and statistical significance.

Summary

Methods used for the collection and analysis of the data were appropriate for this study. These procedures showed what independent variables influenced the dependent variables. The data were maintained for confidentiality. The statistical procedures were selected for appropriateness and to ensure that the data would be analyzed to yield meaningful information concerning leadership of technical-vocational deans in American community colleges.

CHAPTER IV

FINDINGS

Introduction

Chapter four contains the research results and analysis of data collected from technical-vocational deans and their faculty of community colleges. The topics covered in this chapter include: (1) Review of the Research Questions; (2) General Purpose and Process of Structural Equation Modeling; (3) Population and Respondents; (4) Data Analysis; (5) Data Files; (6) Accuracy of Data Entry; (7) Missing Data; (8) Descriptive Statistics; (9) Data Screening using PRELIS; (10) Model Fit; (11) Full SEM; and (12) Summary.

Review of the Research Questions

The research questions for this study are as follows:

RQ1: What is the profile of the single campus community college technical-vocational dean and their faculty?

RQ2: What is the faculty-perceived leadership style of the technical-vocational dean as measured by the Full Range of Leadership Model?

RQ3: What is the self-perceived leadership style of the technical-vocational dean as measured by the Full Range of Leadership Model?

RQ4: Does the dean's self-perceived leadership style have an impact on their perception of faculty outcomes?

RQ5: Does the faculty-perceived leadership style of the dean have an impact on their outcomes?

RQ6: Does gender affect leadership style and faculty outcomes?

General Purpose and Process of Structural Equation Modeling

The general purpose of structural equation modeling (SEM) is to provide an unique analysis that concurrently addresses both measurement and prediction questions. Kelloway (1998) adds to this by saying the true power of structural equation modeling is the ability to estimate a complete model that has both measurement and structural considerations.

The process of SEM involves evaluating the proposed measurement relations with confirmatory factor analysis, a hypothesis-testing approach. The proposed structural relations will be assessed through path analysis once a measurement model is established.

Population and Respondents

To answer the research questions, the Multifactor Leadership Questionnaire (MLQ) Form 5X - Short (Revised) was mailed to a random sample of 398 single campus community colleges. The response rate was 35.2% with 140 colleges returning questionnaires. Of the 140 community colleges responding, 132 deans provided usable data for the structural equation modeling. Demographic information was taken from all questionnaires. Of the 132 community colleges with usable data, 505 faculty responded with 481 faculty providing usable data. Of the 140 community colleges responding, two

colleges self-identified as multicampus, two questionnaires were returned without faculty questionnaires, and four colleges returned surveys without filling out the questionnaires. Therefore, the sample for this study was 132 single campus community colleges.

Data Files

In preparation to analyze data for any descriptive study or SEM, close attention was paid to the accuracy of the data entry. Another area that is rarely addressed in studies is the problem of missing data. The process and procedures used in this study to address accuracy of data entry and missing data follow.

Accuracy of Data Entry

Responses were entered by an independent person utilizing a database system and then importing the database into spreadsheets. The resulting spreadsheet files were compared by a different independent person against the original records. Upon completion of these steps, the appropriate space delimited text files were created and the researcher checked random cases from these text files to the original records. To ensure accuracy with large data sets, it is recommended to screen the data sets through basic descriptive statistics and frequency distributions (Kline, 1998; & Tabachnick and Fidell, 1996).

Missing Data

A pervasive problem with data analysis in any study is missing data (Hatcher, 1994; Kline, 1998; Tabachnick & Fidell, 1996; Schumacker & Lomax, 1996; Wothke, 1993). Of the 505 faculty and 136 leader questionnaires returned, missing data appeared problematic. There is no clear guideline on how much missing data is tolerable for different sample sizes. Cohen and Cohen (1983) suggest that 5% to 10% missing data on a variable is not a large amount. Although Tabachnick and Fidell (1996) do not state outright a percentage of missing data that is considered large, the examples they use 5% as the tolerable amount of missing data. Muthén and Muthén (1998) use a 10% default to avoid computational difficulties in the estimation of models.

The data was subjected to a thorough examination using PRELIS 2.30 (Jöreskog & Sörbom, 2000a). The program determined the number of missing values per variable, the distribution of missing values, the effective sample sizes, and the percentage of missing values. Table 4.1 summarizes the percentage of missing values for each variable in the study.

From Table 4.1, it was determined that for the raters, four of the MLQ-5X variables and three of the demographic questions had over 8% of the data missing. For the leaders, two of the MLQ-5X variables and two of the demographic questions had over 8% of the data missing.

A more serious problem than the amount of missing data involves the pattern of missing observations. Missing data patterns are either random or systematic (Hoyle, 1995; Kline, 1998; Schumacker & Lomax, 1996; Tabachnick & Fidell, 1996). Kline

(1998) describes two patterns of random missing data which are missing at random (MAR) or missing completely at random (MCAR). MAR means that the probability of a value or absence of a value on some variable is not related to the respondent's true status of that variable. MCAR, a stronger assumption about the randomness of data loss indicates that the process of data loss on some variable is not related to the respondents' true status on that variable. The difference between MAR and MCAR is that MCAR implies that the absence or presence of a score on a variable is not related to respondents' scores on other variables in the study and MAR acknowledges this likelihood (Kline, 1998). Tabachnick and Fidell (1996) state that systematically missing data "are serious no matter how few of them there are because they affect the generalizabililty of results" (p. 60). Results established on data from raters and on data from leaders with nonmissing observations should generalize to the results of those with missing data (Kline, 1998). Determining how the sample covariances are to be calculated with missing data is not a simple task.

Deleting cases with missing values on income and ethnicity could distort the sample values on faculty outcomes of satisfaction and willingness to exert extra effort. Even though the researcher determined that it was highly unlikely that respondents who refused to answer questions about income, plans, and ethnicity were related to faculty outcomes of satisfaction and willingness to exert extra effort, this was examined.

To address the concern of missing data, the researcher employed several processes for examining the data. For each variable with over 8% of the data missing, the researcher divided the data into two groups, one with missing data and the other

Table 4.1: Percentage of Missing Values for each Variable - Deans and Faculty

Percentage of Missing Values			Percentage of Missing Values		
Variable	Faculty	Deans	Variable	Faculty	Deans
EE1	7.13	3.68	IS3	6.14	2.94
EE2	5.35	2.94	IS4	6.73	2.94
EE3	5.54	3.68	IC1	6.53	5.15
E1	4.36	3.68	IC2	3.76	2.94
E2	6.93	2.94	IC3	8.91	3.68
E3	5.74	2.94	IC4	6.73	2.94
E4	5.35	2.94	CR1	5.74	31.62
S1	3.76	5.15	CR2	6.93	4.41
S2	3.76	2.94	CR3	6.93	6.62
IIA1	4.75	8.09	CR4	4.36	2.94
IIA2	4.55	2.94	MBEA1	7.13	2.94
IIA3	4.36	2.94	MBEA2	7.92	3.68
IIA4	4.95	4.41	MBEA3	14.46	2.94
IIB1	7.92	3.68	MBEA4	8.12	2.94
IIB2	5.15	3.68	MBEP1	7.52	2.94
IIB3	6.34	2.94	MBEP2	4.55	3.68
IIB4	4.75	3.68	MBEP3	7.13	2.94
IM1	4.16	3.68	MBEP4	5.54	3.68
IM2	3.76	2.94	LF1	3.76	3.68
IM3	4.75	4.41	LF2	4.55	4.41
IM4	3.96	3.68	LF3	4.75	2.94
IS1	8.91	5.15	LF4	5.15	2.94
IS2	5.94	2.94			
POSITION	3.76	0.74	ETHNIC	11.49	10.29
AGE	4.55	2.94	GENDER	2.97	4.41
YRSPOS	0.00	0.00	BI	1.98	0.74
BIYRS	0.00	0.00	DEGREE	1.98	0.74
PRIORPOS	7.92	0.74	PLANS	13.86	6.62
ADVCM	4.36	1.47	ACTIVEBI	2.57	0.74
ARTICULA	4.75	2.94	SALARY	12.28	8.82

YRSPOS - Years in current position
PRIORPOS - Position prior to dean
ARTICULA - Active articulation agreements
ETHNIC - Ethnicity
BIYRS - Years spent in business or industry
ADVCM - Advisory committee effective
BI - Business or Industry experience
ACTIVEBI - Active with area business or industry

without missing data. Comparing the means on several outcome variables and demographic variables revealed no significant differences on the outcome variables. However, there were interesting trends in the demographic variables. These results can be seen in Table 4.2 for the raters and in Table 4.3 for the leaders. Thus, the researcher assumed the data are missing at random (MAR) for this study.

The statements for the raters to describe their deans leadership style on the MLQ-5X with missing values in over 8% of the cases were IS1, IC3, MBEA3 and MBEA4. The statement related to IS1 says, *(the leader) re-examines critical assumptions to question whether they are appropriate.* The statement for IC3 says *(the leader) considers me as having different needs, abilities, and aspirations from others.* The statement for MBEA3 says, *(the leader) keeps track of all mistakes.* The statement for MBEA4 says, *(the leader) directs my attention toward failures to meet standards.* These four statements appear to differ from the rest of the statements given for the raters to score their dean's leadership style.

The other statements on the rater's form appear to represent either a leader's behavior that is directly observable by the faculty member or elicits a feeling from the faculty member.

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For example, the IC4 says, *(the leader) helps me to develop my strengths,* is a directly observable behavior by the faculty. Other statements appear to elicit feelings from the faculty. In contrast, IS1, IC3, MBEA3, and MBEA4 are questions that appear to ask the faculty to make assumptions or judgements about the state of mind of the dean. These questions do not have directly observable behaviors for the faculty to observe or do not elicit feelings from the faculty. No deletions of these variables was performed since the MLQ-5X is already published and in use.

When cases have missing data, either the missing values are estimated, the cases deleted, or a pairwise missing data matrix is analyzed (Kelloway, 1998; Kline, 1998; Tabachnick & Fidell, 1996; Schumacker & Lomax, 1996). The researcher examined these different possibilities for handling the missing data. Listwise deletion is where all cases with one or more missing values on any variable are deleted. Pairwise deletion involves cases that are excluded only if they have missing data on the variables involved in a particular computation (Kline, 1998, p. 76). When pairwise deletion is used, the effective sample size varies from analysis to analysis and can result in a nonpositive definite matrix (Wothke, 1993).

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Table 4.2: Means and Trends for Faculty with missing data versus no missing data

Variables >8% missing data	Groups	Percentage of Variables chosen to compare means and trends EE1	EE2	EE3	S1	S2	male	female	salary
IS1	no missing	2.53	3.04	2.90	3.01	3.35	59.9	40.1	$44521
	missing	2.29	2.91	3.00	3.00	3.44	51.2	48.8	$47933
IC3	no missing	2.52	3.03	2.91	3.00	3.34	58.8	41.2	$44492
	missing	2.62	3.04	2.86	3.31	3.56	62.8	37.2	$48437
MBEA3	no missing	2.50	3.01	2.89	2.99	3.34	58.8	41.2	$44742
	missing	2.69	3.24	3.02	3.22	3.47	61.4	38.6	$45270
MBEA4	no missing	2.51	3.02	2.89	3.00	3.35	59.7	40.3	$44720
	missing	2.86	3.42	3.24	3.30	3.48	53.9	46.1	$45975
ETHNIC	no missing	2.54	3.07	2.94	3.04	3.39	59.0	41.0	$44818
	missing	2.39	2.71	2.62	2.74	3.06	60.8	39.2	$44778
PLANS	no missing	2.54	3.05	2.92	3.03	3.36	57.6	42.4	$44570
	missing	2.39	2.94	2.83	2.90	3.32	69.8	30.2	$47413
SALARY	no missing	2.54	3.04	2.91	3.01	3.38	57.5	42.5	$44814
	missing	2.41	2.98	2.88	3.00	3.21	72.7	27.3	missing

EE1 - Question 1 for extra effort
EE2 - Question 2 for extra effort
EE3 - Question 3 for extra effort
S1 - Question 1 for satisfaction
S2 - Question 2 for satisfaction

IS1 - Question 1 for Intellectual Stimulation
IC3 - Question 3 for Individual Consideration
MBEA3 - Question 3 for Management-by-Exception Active
MBEA4 - Question 4 for Management-by-Exception Active
ETHNIC - Ethnicity

Table 4.3: Means and Trends for Deans with missing data versus no missing data

Variables >8% missing data	Groups	Percentage of Variables chosen to compare means and trends EE1	EE2	EE3	S1	S2	male	female	salary
IIA1	no missing	2.93	3.15	3.10	3.17	3.51	75.8	24.2	$65369
	missing	3.14	3.29	3.14	3.43	3.57	80.0	20.0	$63375
CR1	no missing	2.92	3.15	3.11	3.12	3.51	77.5	22.5	$65130
	missing	2.97	3.18	3.11	3.35	3.54	73.2	26.8	$65545
ETHNIC	no missing	2.93	3.17	3.12	3.19	3.50	75.4	24.6	$44818
	missing	3.00	3.08	3.00	3.18	3.67	83.3	16.7	$44778
SALARY	no missing	2.95	3.17	3.13	3.18	3.50	75.0	25.0	$65240
	missing	2.82	3.09	2.91	3.30	3.64	90.0	10.0	missing

EE1 - Question 1 for extra effort
EE2 - Question 2 for extra effort
EE3 - Question 3 for extra effort
S1 - Question 1 for satisfaction
S2 - Question 2 for satisfaction
IIA1 - Question 1 for Idealized Influence Active
CR1 - Question 1 for Contingent Reward
ETHNIC - Ethnicity

Estimating missing values was another option that was explored. There are several ways to estimate missing data. A liberal approach is to use prior knowledge and replace a missing value with a well-educated guess (Tabachnick & Fidell, 1996). In contrast, a conservative approach is to compute the overall mean and insert it into the place of the missing values. Another method, that is less conservative, is to insert the group mean for the particular variable for a missing value. However, these methods do reduce the variance of the variable since the mean is likely closer to itself than to the missing value it replaces. Another estimation of missing values is through pattern

matching or imputation. A missing value is replaced by a value from another case with a similar profile of responses.

The researcher used several of the above methods and compared the results with little differences, except for listwise deletion. Listwise deletion of the cases resulted in a loss of 50.1% cases. This was disappointing and considered unacceptable. Pattern matching was considered next. PRELIS 2.30 (Jöreskog & Sörbom, 2000a) was utilized to do the imputation. This resulted in only two cases with missing values being retained. Again, these results were unsatisfactory. Next, pairwise deletion was utilized and analyses on the results performed. These results were also unsatisfactory. Since the disadvantages of using pairwise deletion or inserting a value with either the overall or group mean were similar, the researcher proceeded with inserting the group mean for a missing value.

Findings

This research project investigated six research questions. Results are reported for each of the six research questions.

Descriptive Statistics

Research question one concerning the profile of the single campus community college technical-vocational dean and their faculty is explored in this section of descriptive statistics. An important feature of discerning any population is identifying attributes of its members. No known national profile exists of only the deans of

technical-vocational divisions of single campus community colleges. Additionally, there is no known national profile for the technical-vocational faculty of single campus community colleges. This section reviews the profile of personal characteristics and job characteristics of the dean and faculty. Perceived community participation by the technical-vocational division are described.

Personal Characteristics

Personal characteristic items for this study were age, gender, ethnicity, and degree. With respect to gender, 23.5% of the dean respondents were female and 72.7% were male. In terms of gender for the raters, 57.6% are female and 39.7% are male. The percentages for gender between rater and leaders are approximately inversely related 2:1.

With respect to leaders' ethnicity, 89.3% were Caucasian. Complementing these findings, 82.6% of the raters reported their ethnicity as Caucasian. Both groups were approximately equal in the percentages of not reporting their ethnicity, with leaders and raters respectively, 9.1% and 9.8%. By gender, the results were similar and are shown in Table 4.5.

Of interest was the highest degree attained for those in technical-vocational divisions. Over 95% of the deans reported a degree at the master's level or above. Nearly one-third of the faculty reported a degree at a baccalaureate level or below, while 65% had a degree at the master's level or above. Results are shown below in Table 4.4.

Table 4.4: Personal characteristics of Technical-Vocational Deans and Faculty

Characteristics	Categories	Dean's % Response	Faculty's % Response
Your age	< 30	0	2.4
	30-44	13.3	32.5
	45-54	52.2	43.1
	55-64	31.6	15.6
	≥ 65	0	1.8
	Unlisted	2.9	4.6
Your gender	Female	23.5	39.7
	Male	72.7	57.6
	Unlisted	3.8	2.7
Your ethnicity	Caucasian	89.3	82.6
	Hispanic	0.8	1.9
	Black	0.8	3.1
	Asian	0	0.6
	Native American	0	1.2
	Other	0	0.8
	Unlisted	9.1	9.8
Highest degree attained	Certificate program	0	2.7
	Associate	2.3	9.4
	Baccalaureate	1.5	20.2
	Master's	50.8	55.4
	Ed.D.	26.5	3.7
	Ph.D.	18.1	5.2
	Other	0.8	1.5
	Unlisted	0.0	1.9

Figure 4.1 illustrates that nearly one-third of the existing technical-vocational deans will need to be replaced within the next 12 years, and over 83% in the next 22 years, if the average age of retirement remains at 67 (the age to receive full social security benefits).

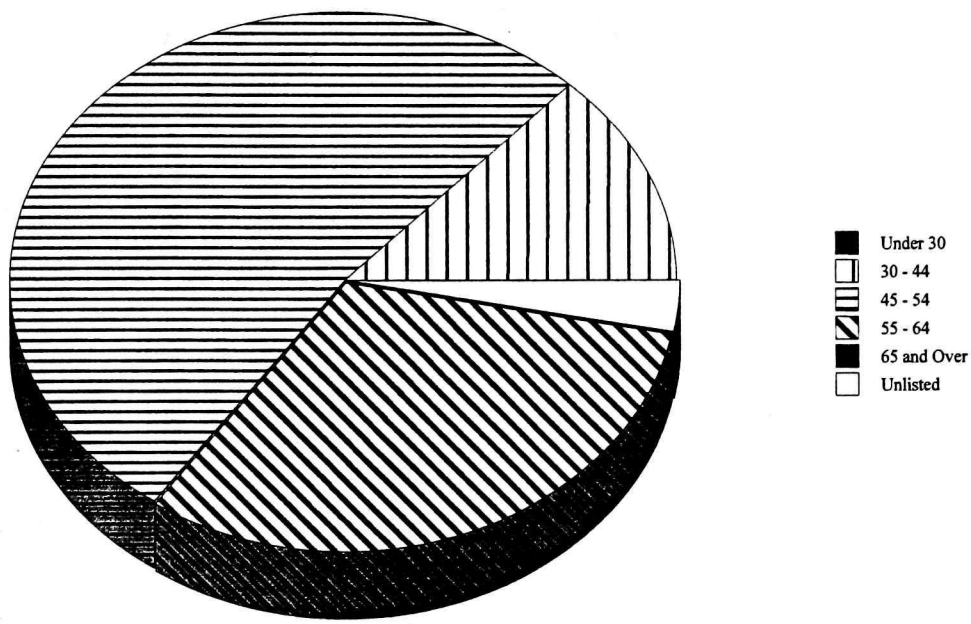

Figure 4.1: Age of community college technical-vocational deans

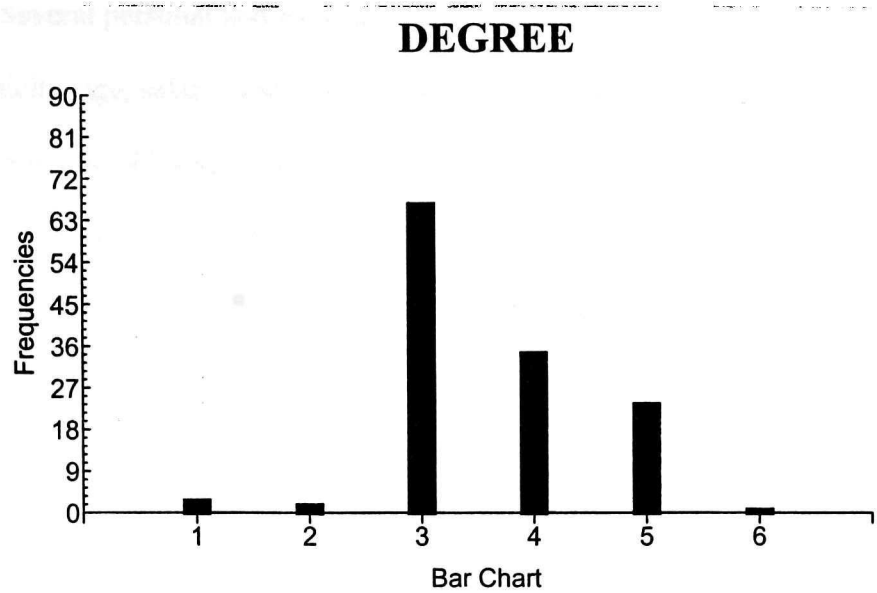

Figure 4.2: Degree of technical-vocational deans in study

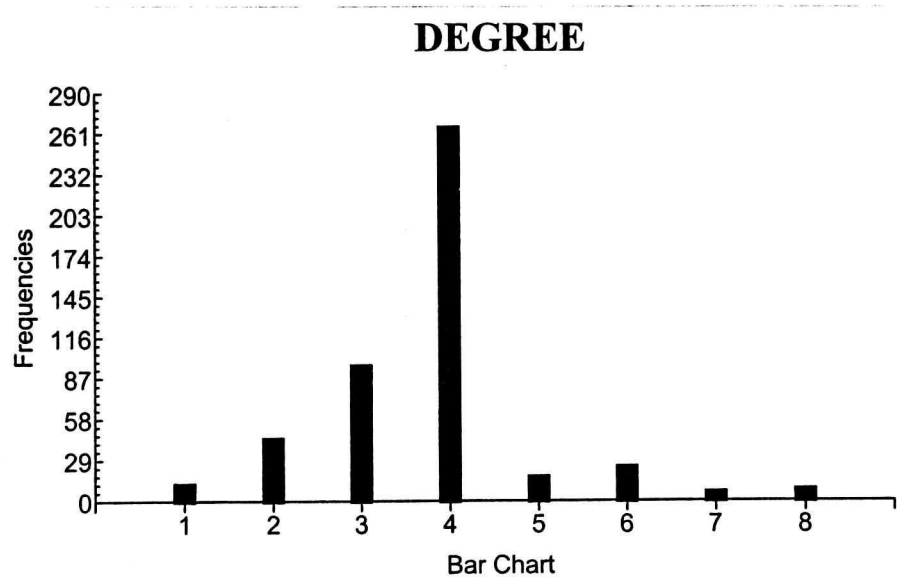

Figure 4.3: Degree of technical-vocational faculty in study

CERT - Certificate degree
ASSC - Associate degree
BACC - Baccalaureate degree
UNLS - Unlisted
MAST - Master's degree
EDD - Doctor of Education degree
PHD - Doctor of Philosophy degree

Several personal and job characteristics by gender are given in Table 4.5. These are ethnicity, age, salary, and years in position. This study found that the average age for male deans were 47.4 years while the female deans average age was 46.7 years. The faculty had a very slight difference between males and females, 48.4 and 45.8 years of age, respectively. The annual salary for technical-vocational faculty and dean males was $3807 and $3750 more than, respectively, their female colleagues. These results can be seen in Table 4.6. Other tables relating to gender in the framework of external contacts and job characteristics can be found in Appendix E.

Table 4.5: Ethnicity by Gender

	Deans			Faculty		
Ethnicity	All	Male	Female	All	Male	Female
Caucasian	89.3	88.6	93.5	82.6	82.3	85.9
Hispanic	0.8	1.0	0	1.9	2.5	0.5
Black	0.8	1.0	0	3.1	2.5	3.7
Asian	0	0	0	0.6	0.4	1.0
Native American	0	0	0	1.2	1.1	1.0
Other	0	0	0	0.8	1.1	0.6
Unlisted	9.1	9.4	6.5	9.8	10.1	7.3

Table 4.6: Personal and Job Characteristics by Gender

	Deans		Faculty	
	Male	Female	Male	Female
Age	47.4	46.7	48.4	45.8
Years in position	6.8	4.6	10.0	8.9
Salary	$66149	$62399	$46333	$42526

Job Characteristics

With respect to the dean's title, 59.6% held the title of dean, 15.9% held the title of chair and 14.7% had the title of vice-president. Over 55% of the faculty responding held the title of instructor or associate professor. The percentage of the faculty with the title of chair was 22%. The titles for the faculty and the person directly in charge of the technical-vocational faculty varied considerably.

The number of years spent in the dean's current position was 57.3% for one to five years, while 40.5% had more than six years in their current position. Similarly, 42% of the faculty had been working in their current position between one and five years. For the faculty who reported six or more years in their current position, the percentage was 54.7%. Over 72% of the deans had experience working in business and industry. And over 80% of the faculty had experience working in business and industry. The number of years working in business and industry was interesting. Slightly more than 15% of the dean's and 21% of the faculty reported twenty or more years working in business and industry.

Contrasted with these results were the percentages for the dean's prior position. For their position prior to becoming a dean, 0% had their prior position in industry or as a public school teacher. Over 57% of the dean's reported their prior position as post-secondary instructor or coordinator or chair. Over 41% listed their prior position as other. Over 36% of the faculty reported their prior position being in industry. Other prior positions for faculty included 7.5% as a public school instructor, while nearly 30% served as a post-secondary instructor. Also, 13.7% listed their prior position as the

coordinator or chair. The position, tenure, and prior experience results are highlighted in Table 4.7.

Table 4.7: Position, Tenure, and Prior Experience of Technical-Vocational Deans

Characteristics	Categories	Dean's Response (%)	Faculty's Response (%)
Your current position	Vice-President	14.7	0
	Professor/Instructor	2.3	41.3
	Associate Professor	0	14.1
	Chair	15.9	22.0
	Coordinator	0	15.4
	Dean	59.6	2.5
	Other	3.7	1.2
	Unlisted	3.8	3.5
Years in your current position	< 1	2.2	3.4
	1 - 5	57.3	42.0
	6-10	20.6	20.5
	11-15	11.8	13.9
	16-20	1.5	6.7
	≥ 20	6.6	13.5
Did you work in business/industry	Yes	72.8	80.2
	No	26.5	17.8
	Unlisted	0.7	2.0
Years spent working in business/industry	< 1	3.0	3.5
	1 - 5	41.4	24.4
	6 - 10	26.3	25.7
	11 - 15	12.1	18.8
	16 - 20	2.0	5.9
	≥ 20	15.2	21.7
Prior position	Industry	0	36.2
	Public School Teacher	0	7.5
	Post-secondary Instructor	24.3	29.3
	Coordinator/Chair	33.1	13.7
	Other	41.9	5.4
	Unlisted	0.7	7.9

Perceived Community Participation

Over 59% of the dean's said their program advisory committees were functioning well. This was contrasted to the 66% of the faculty agreeing. However, more than 25% of the faculty and 38% of the dean's also said that improvement was needed on their program advisory committees.

Responding to whether their division was active with business or industry, over 76% of the faculty and 81% of the deans agreed their divisions were active. Both the deans' and faculties' response as to whether improvement was needed in their contact with business or industry was, respectively, 18.2% and 17.9%.

Other evidence of external contact included 72% of the deans and 62% of the faculty stating the programs had active articulation agreements. Approximately 15% of the faculty said they did not have active articulation agreements contrasted to more than 7% of the dean's. Improvement needed reported in this category was 18.9% for the dean's and 18.1% for the faculty. These results can be seen in Table 4.8.

Table 4.8: Perceived Community Participation with Regional Business or Industry and Public Schools

Characteristics	Categories	Dean's Response (%)	Faculty's Response (%)
Your program advisory committee(s) function well	Yes	59.8	66.8
	No	0.8	3.7
	Improvement Needed	38.6	25.8
	Unlisted	0.8	3.7
Your division(s) active with business or industry	Yes	81.1	76.5
	No	0.7	3.5
	Improvement Needed	18.2	17.9
	Unlisted	0.0	2.1
Program(s) have active articulation agreements	Yes	72.0	62.8
	No	7.6	15.0
	Improvement Needed	18.9	18.1
	Unlisted	1.5	4.1

Data Screening Using PRELIS

PRELIS 2.30 (Jöreskog & Sörbom, 2000a) was used for data-screening purposes. Descriptive information for the MLQ-5X was provided in the output file, which is partially shown in Table 4.9 and Table 4.10. The information is comprehensive. The mean, standard deviation, skewness, and kurtosis coefficients are provided for the leaders and the raters. In addition, the number of cases at both the low and high ends of the scale are given. Observing the histograms for each variable provides a pictorial summary of distributional information. The ratio of cases to observed variables is 10:1 and within

the recommended limits. The relative multivariate kurtosis for the deans is 1.254 and for the faculty is 1.133.

In order to answer research questions two through six, several processes occurred. The first process was to describe the hypothesized model. Next, the researcher examined whether the indicators loaded on one, two, or three latent factors. Once the number of factors was determined, an initial measurement model was then described. Then confirmatory factor analyses were performed to assess the fit of the model. Revisions were done and a final revised measurement model was described. This procedure was done for each of the six groups under consideration in this study. These groups are: (1) Faculty; (2) Male Faculty; (3) Female Faculty; (4) Deans; (5) Male Deans; and (6) Female Deans. Finally, the full structural equation model was described and analyzed for the faculty and for the deans.

The Hypothesized Model

The hypothesized model is presented in Figure 4.4 where circles characterized latent variables (factors) and rectangles represented measured variables (indicators). Absence of a line connecting variables implied no hypothesized direct effect. The structural model considered was based on the hypotheses that two factors, perceived transformational leadership and transactional leadership, predicted the factor of perceived faculty outcomes in the technical-vocational division in the community colleges.

Table 4.9 Descriptive information for MLQ-5X for Leaders

Univariate Summary Statistics for Continuous Variables

Variable	Mean	St. Dev.	T-Value	Skewness	Kurtosis	Minimum	Frequency	Maximum	Frequency
EE	2.829	1.055	58.801	-0.960	0.281	0.000	15	4.000	92
E	3.121	0.908	75.382	-1.228	0.939	0.000	4	4.000	113
S	3.180	0.998	69.871	-1.392	1.275	0.000	9	4.000	191
IIA	3.056	0.892	75.108	-1.080	0.650	0.000	2	4.000	93
IIB	2.921	0.825	77.617	-0.976	0.716	0.000	2	4.000	46
IM	3.220	0.815	86.661	-1.291	1.433	0.000	1	4.000	124
IS	2.783	0.852	71.668	-0.759	0.215	0.000	1	4.000	43
IC	2.720	0.911	65.466	-0.815	0.213	0.000	6	4.000	32
CR	2.990	0.899	72.971	-1.126	1.016	0.000	5	4.000	74
MBEA	1.464	0.962	33.372	0.413	-0.447	0.000	42	4.000	7
MBEP	1.366	0.915	32.751	0.466	-0.443	0.000	44	4.000	2
LF	0.870	0.867	21.994	1.065	0.555	0.000	112	4.000	1

Test of Univariate Normality for Continuous Variables

		Skewness		Kurtosis	Skewness and Kurtosis	
Variable	**Z-Score**	**P-Value**	**Z-Score**	**P-Value**	**Chi-Square**	**P-Value**
EE	-8.619	0.000	1.242	0.214	75.822	0.000
E	-11.030	0.000	3.127	0.002	131.449	0.000
S	-12.498	0.000	3.836	0.000	170.913	0.000
IIA	-9.702	0.000	2.398	0.016	99.884	0.000
IIB	-8.768	0.000	2.575	0.010	83.519	0.000
IM	-11.599	0.000	4.130	0.000	151.604	0.000
IS	-6.819	0.000	0.998	0.318	47.494	0.000
IC	-7.321	0.000	0.990	0.322	54.573	0.000
CR	-10.113	0.000	3.301	0.001	113.163	0.000
MBEA	3.712	0.000	-2.523	0.012	20.143	0.000
MBEP	4.182	0.000	-2.493	0.013	23.700	0.000
LF	9.569	0.000	2.127	0.033	96.091	0.000

Relative Multivariate Kurtosis = 1.254 Total Sample Size = 132

Table 4.10 Descriptive information for MLQ-5X for Raters

Univariate Summary Statistics for Continuous Variables

Variable	Mean	St. Dev.	T-Value	Skewness	Kurtosis	Minimum	Frequency	Maximum	Frequency
EE	3.068	0.613	57.467	-0.846	2.274	0.330	1	4.000	16
E	3.384	0.477	81.536	-1.387	5.838	0.750	1	4.000	23
S	3.352	0.562	68.537	-1.261	4.004	0.500	1	4.000	35
IIA	3.145	0.519	69.563	-1.509	6.614	0.250	1	4.000	7
IIB	3.227	0.568	65.236	-1.011	2.408	0.750	1	4.000	18
IM	3.366	0.508	76.085	-1.485	6.466	0.500	1	4.000	23
IS	3.251	0.455	82.070	-0.517	0.743	1.500	1	4.000	10
IC	3.351	0.520	73.986	-1.734	8.349	0.250	1	4.000	22
CR	3.196	0.531	69.200	-1.000	2.525	0.750	1	4.000	11
MBEA	1.466	0.778	21.640	0.433	-0.275	0.000	2	3.750	1
MBEP	1.114	0.676	18.938	0.560	-0.197	0.000	6	3.250	1
LF	0.557	0.530	12.086	1.364	2.441	0.000	30	2.750	1

Test of Univariate Normality for Continuous Variables

	Skewness		**Kurtosis**		**Skewness and Kurtosis**	
Variable	**Z-Score**	**P-Value**	**Z-Score**	**P-Value**	**Chi-Square**	**P-Value**
EE	-3.671	0.000	3.208	0.001	23.769	0.000
E	-5.327	0.000	4.922	0.000	52.602	0.000
S	-4.983	0.000	4.225	0.000	42.679	0.000
IIA	-5.640	0.000	5.151	0.000	58.339	0.000
IIB	-4.229	0.000	3.307	0.001	28.822	0.000
IM	-5.580	0.000	5.110	0.000	57.244	0.000
IS	-2.394	0.017	1.598	0.110	8.285	0.016
IC	-6.170	0.000	5.572	0.000	69.123	0.000
CR	-4.193	0.000	3.390	0.001	29.073	0.000
MBEA	2.032	0.042	-0.607	0.544	4.500	0.105
MBEP	2.574	0.010	-0.367	0.714	6.758	0.034
LF	5.266	0.000	3.331	0.001	38.830	0.000

Relative Multivariate Kurtosis = 1.133 Sample Size = 481

Each of the latent variables in the structural relationship was represented by multiple indicators. For a confirmatory factor analysis, there needs to be at least two indicators for each latent variable (Hatcher, 1994; Byrne, 1998; Kline, 1998; Schumacker & Lomax, 1996). Alternate methods to analyze single indicators exist. Researchers could use a mixed model (Hatcher, 1994; Jöreskog & Sörbom, 1996b). Another method is to compose the indicators from the single items (Kelloway, 1998). Another method is to see if the single indicator can load on a similar factor. Since the nontransactional factor only had one indicator, laissez-faire, the researcher included the indicator on the transactional factor. No recoding was necessary.

The indicators of the perceived endogenous faculty outcomes factor are faculty willingness to exert extra effort (EE), perceived dean effectiveness (E), and satisfaction (S). The indicators of the perceived transformational factor are Idealized Attributes (IA), Idealized Behaviors (IB), Inspirational Motivation (IM), Intellectual Stimulation (IS), and Individual Consideration (IC). Indicators for the perceived transactional factor are Contingent Reward (CR), Management by Exception Active (MBEA), Management by Exception Passive (MBEP), and Laissez-faire (LF). These indicators are scales from the MLQ-5X (Bass & Avolio, 1997).

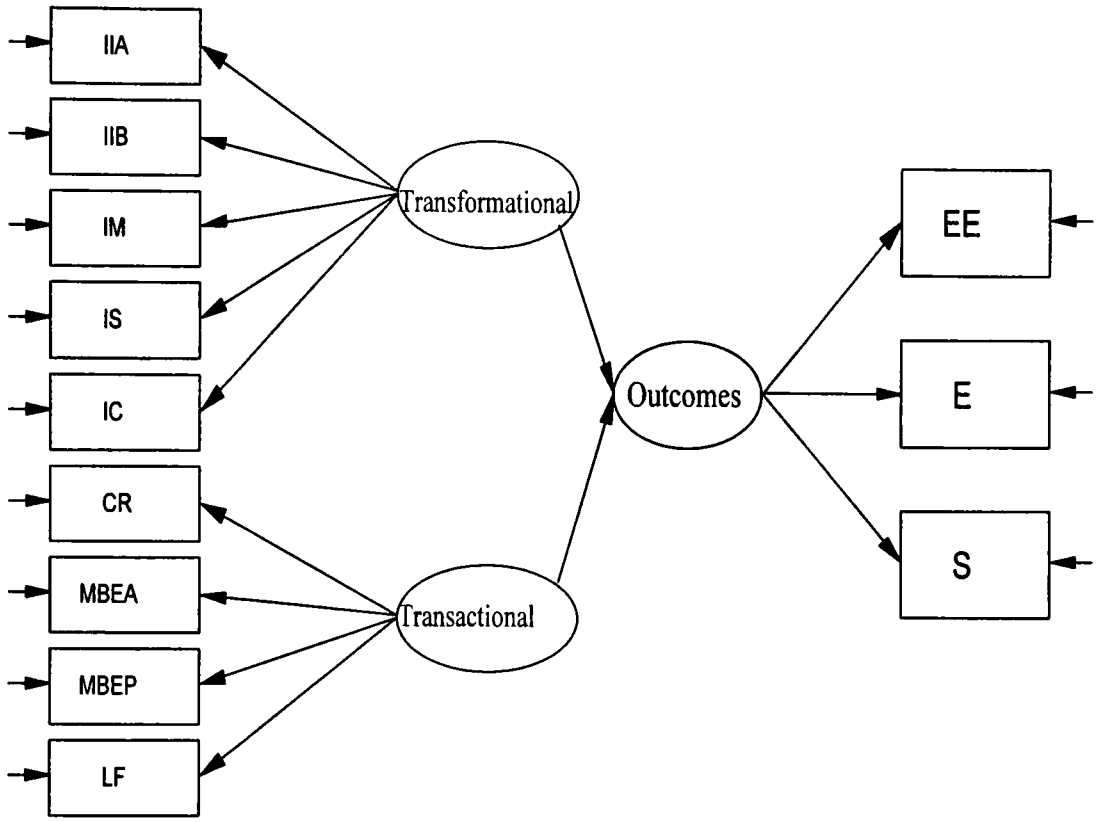

Figure 4.4: The Hypothesized Model

IIA - Idealized influence attributed
IIB - Idealized influence behavior
IM - Inspirational Motivation
IS - Intellectual Stimulation
IC - Individual Consideration
CR - Contingent Reward
EE - Extra Effort
S - Satisfaction
MBEA - Management-by-Exception Active
MBEP - Management-by-Exception Passive
LF - Laissez-faire
TRANSFOR - Transformational leadership
TRANSACT - Transactional leadership
OUTCOMES - Faculty outcomes
E - Effectiveness

A primary concern in working with the full model was to assess the extent to which these relationships were valid. Thus, it was important that the measurement of each latent variable was considered psychometrically sound. This lead to an important preliminary step. In the analysis of the hypothesized full latent variable model, the researcher first tested for the validity of the measurement model before attempting to analyze the structural model. The measurement model can be seen in Figure 4.5.

Confirmatory Factor Analysis (CFA) was used in testing the validity of the indicator variables which composed the measurement relationships with the latent variables. Once it is determined what the final measurement model is, one can have more confidence in results related to the assessment of the hypothesized structural model. The initial measurement model for both the deans and the faculty is shown in Figure 9 below.

This measurement model assessed in the beginning for each group was not identical to the hypothesized model in Figure 4.4. In Figure 4.4, certain unidirectional relationships between the latent variables are shown. Instead, in the Figure 4.5 measurement models, covariances were estimated to connect each latent variable with every other latent variable. The purpose of the confirmatory factor analysis was to take a hypothesized model and examine how well it accounts for the observed relationships in the data. The model was tested repeatedly, attempting to find a model that was not rejected.

See Appendix F for the sample variance-covariance matrix analyzed by LISREL 8.30 (Jöreskog & Sörbom, 2000b) for the faculty measurement model and for the dean's

measurement model. The source code designed for this analysis is located in Appendix G.

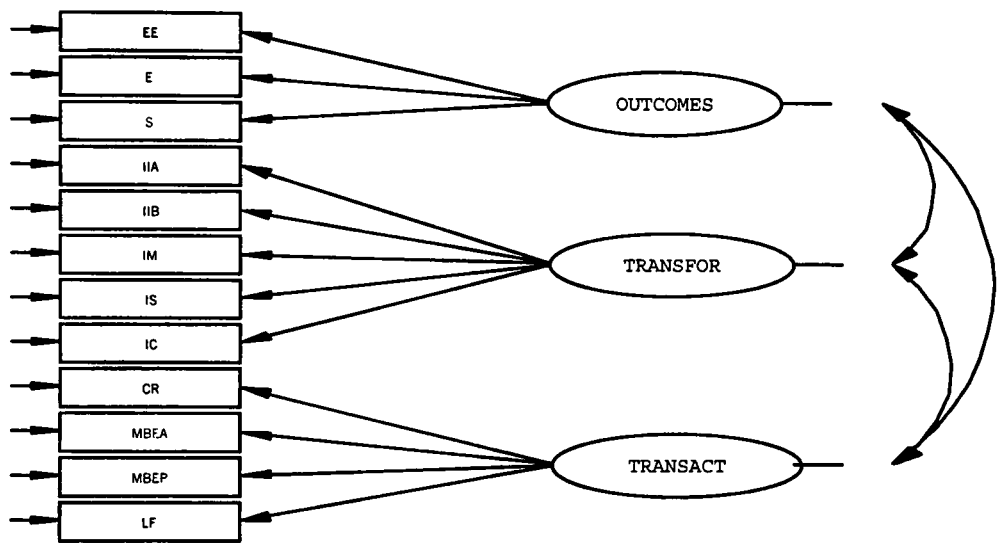

Figure 4.5: The Initial Measurement Model for Both the Deans and the Faculty Three-Factor Oblique Model

IIA - Idealized influence attributed
IIB - Idealized influence behavior
IM - Inspirational Motivation
IS - Intellectual Stimulation
IC - Individual Consideration
CR - Contingent Reward
EE - Extra Effort
S - Satisfaction
MBEA - Management-by-Exception Active
MBEP - Management-by-Exception Passive
LF - Laissez-faire
TRANSFOR - Transformational leadership
TRANSACT - Transactional leadership
OUTCOMES - Faculty outcomes
E - Effectiveness

Similar to the work of Bass & Avolio (1995), several models were considered and these models were contrasted with the initial three-factor oblique model. In order to use direct comparisons with the χ^2 difference test, these models were in nested sequence. Specifically, the researcher ran a sequence of confirmatory factor analyses to determine if the data from the MLQ-5X were better illustrated by other models. Kelloway (1998) notes that for any model that contains a number of correlated factors, nested models may be obtained by constraining interfactor correlations to equal zero (p. 56). To contrast with the three-factor oblique model, the models considered were: (1) a three factor orthogonal model; (2) a two factor oblique model; (3) a two factor orthogonal model; and (4) a one factor model. These models are shown in Appendix H.

This method for the confirmatory factor analyses was followed for each group considered in this study. These groups are: (1) Faculty; (2) Male Faculty; (3) Female Faculty; (4) Deans; (5) Male Deans; and (6) Female Deans. The results for each group are given.

Model Fit

Confirmatory factory analyses, based on data gathered from community college technical vocational deans and their faculty, was performed through LISREL 8.30 (Jöreskog & Sörbom, 2000b) on the twelve scales of the MLQ-5X. Through this method, the researcher attempted to establish a fit of the measurement model. The measurement model describes the nature of the latent variables (variables that are unobserved) and the scale indicator variables (observed variables) that measure those latent variables. In

structural equation modeling, establishing a fit for the measurement model is necessary to consider the full latent model. For structural equation modeling, which has both structural and measurement relationships, the full model will not furnish a better fit to the data than the measurement model. Each confirmatory factor analysis was based on the maximum likelihood estimation method of parameter estimation. All analyses were p performed on the variance-covariance matrices relevant to the particular group.

Group 1: Faculty

Considered first was the faculty three-factor oblique model. The results were not surprising. The chi-square (χ^2) independence model (null model) was rejected, $\chi^2(66, N=481) = 5756.76$, $p<0.01$. The minimum fit function chi-square model was also rejected, $\chi^2(51, N=481) = 401.98$, $p<0.01$. Since the minimum fit function chi-square statistic equals (N - 1)F(min), the value can be sizable when sample size is large and the model does not hold (Byrne, 1998; Jöreskog & Sörbom, 1996b; Kelloway, 1998; Kline, 1998). Widely accepted in the literature is the following statement by Jöreskog and Sörbom (1996b).

> In practice it is more useful to regard chi-square as a measure of fit rather than as a test statistic. In this view, chi-square is a measure of overall fit of the model to the data. It measures the distance (difference, discrepancy, deviance) between the sample covariance (correlation) matrix and the fitted covariance (correlation) matrix. Chi-square is a badness-of-fit measure in the sense that a small chi-square corresponds to good fit and a large chi-square to bad fit. (p. 122)

Thus, the chi-square results obtained are not unexpected and as a measure of fit indicate a

need to modify the model in order to better fit the data (Byrne, 1996; Kline, 1998; Kelloway, 1998).

To deal with the limitations of chi-square, a number of fit indices with a more practical approach to the assessment process are used. Goodness-of-fit indices are based on the discrepancies between the overall fit of the model to the data. Although LISREL 8.30 gives a number of goodness-of-fit measures, a single fit index for assessing a model is not in existence (Schumacker & Lomax, 1996, p. 135). Schumacker and Lomax (1996) discuss the three categories of fit indices. They are model fit, model comparison, and model parsimony. Model fit measures how well the model fits the data. Model comparison is used for comparing other models to a base model. Finally, model parsimony considers the number of parameters needed to derive a chi-square value. For this study, the researcher chose to interpret the model fit indices of χ^2, Goodness-of-Fit (GFI) index, Adjusted Goodness of Fit Index (AGFI), and the Root Mean Square Error of Approximation (RMSEA). For the model comparison, the Normed Fit Index (NFI) and the Comparative Fit Index (CFI) were used. For the model parsimony, the Parsimony Normed Fit Index (PNFI), and the Parsimony Goodness of Fit Index (PGFI) were chosen.

The group 1 faculty three-factor oblique model goodness of fit index (GFI) was 0.87 and the adjusted goodness of fit index (AGFI) was 0.80. The GFI of 0.87 indicated that the theoretical model is 87% of the way between an independence model and the perfect model. The root mean square error of approximation (RMSEA) is 0.12. The normed fit index (NFI), the comparative fit index (CFI), and the parsimony normed fit index (PNFI), were respectively, 0.93, 0.94, and 0.72. The CFI of 0.94 indicated a very

good fit of the theoretical model. The parsimony goodness of fit index (PGFI) was 0.57. The accepted bounds indicating a good fit for GFI, AGFI, NFI, PNFI, PGFI are greater than 0.90 and the RMSEA less than 0.10 (Kelloway, 1998; Kline, 1998; Schumacker & Lomax, 1996; and Tabachnick & Fidell, 1996). With the exception of CFI and PNFI, all the fit indices were outside the bounds that indicate a good fit to the data. The fit indices for the group 1 faculty models are presented in Table 4.11.

Table 4.11: Fit Indices for the Group 1 Faculty Models

Model	χ^2	df	GFI	AGFI	RMSEA	NFI	CFI	PNFI	PGFI
Independence model	5756.76	66							
1. 3-factor oblique	401.98	51	.87	.80	.12	.93	.94	.72	.57
2. 3-factor orthogonal	1759.01	54	.69	.55	.22	.69	.70	.57	.48
3. 2-factor oblique	452.37	53	.85	.78	.13	.92	.93	.74	.58
4. 2-factor orthogonal	1266.54	54	.79	.69	.17	.78	.79	.64	.54
5. 1-factor	574.32	54	.81	.72	.16	.90	.91	.74	.56

Comparison with the other Group 1 faculty models revealed the three-factor oblique model produced a better fit to the data than did the model with three orthogonal factors [χ^2difference(3) = 1357.03, $p<.01$], two oblique factors [χ^2difference(2) = 50.39, $p<.01$], two orthogonal factors [χ^2difference(3) = 864.56, $p<.01$], or one factor

[χ^2difference(3) = 172.34, p<.01]. Inspection of the fit indices suggested that the three factor oblique model provided a slightly better fit to the data. Although the three-factor oblique model produced a better fit to the data than to the other models, the three-factor oblique model itself did not provide a very good fit to the data.

Since the model did not fit adequately, a closer examination of the fit was necessary to determine the possible sources of the lack of fit. For this purpose, LISREL 8.30 (Jöreskog & Sörbom, 2000b) produces fitted residuals, standardized residuals and modification indices. A large positive residual indicates that the model underestimates the covariance between the two variables. Large positive residuals indicate where a path should be added between two indicators. A large negative residual indicates that the model overestimates the covariance between the two variables. Thus, a large negative residual indicates the model should be modified by eliminating the path between the two variables. The residuals were inspected through a stemleaf plot and a Q-plot. In the stemleaf plot, the residuals should be symmetrical about zero. A good model would be evidenced in the Q-plot by points falling on y = x where x>0 and y >0. These plots can be seen in Appendix I. The plot is shallower than y = x and is indicative of a model that has a poor fit.

Next, the standardized parameter estimates for the three factor oblique model and item variance are examined and shown in Table 4.12. The squared multiple correlations (R^2) for each variable represent the amount of variance explained by the three factor oblique model in each observed indicator. Management-by-exception active, with an R^2 of 0.00, is clearly problematic for group 1. Management-by-exception passive R^2 is slightly below the accepted level of 0.40.

Table 4.12: Standardized Parameter Estimates for the Three Factor Oblique Model Group 1 Faculty

Indicator	Outcomes	Transformational	Transactional	R^2
EE	.89			.79
E	.96			.92
S	.95			.90
IIA		.93		.86
IIB		.80		.64
IM		.86		.74
IS		.83		.69
IC		.86		.74
CR			.90	.81
MBEA			-.06	.00
MBEP			-.60	.36
LF			-.73	.53

As shown in Table 4.13, the three factors were highly correlated.

Table 4.13: Interfactor Correlations

	Outcomes	Transformational	Transactional
Outcomes	1.00		
Transformational	0.93	1.00	
Transactional	0.97	0.95	1.00

Modification indices (Sörbom, 1989) were computed for each fixed and constrained relationship in the model. Each modification index gauged the amount chi-square was expected to decrease once this relationship was set free to be estimated in a model respecification. These modification indices were helpful in the model respecification. Only the relationships that are meaningful within the literature were considered. The modification indices are shown in Table 4.14.

Table 4.14: Modification Indices

Indicators	Outcomes	Transformational	Transactional
EE		17.53	5.80
E		2.01	1.79
S		4.79	0.89
IIA	15.43		13.75
IIB	28.19		27.84
IM	10.63		9.55
IS	9.43		5.73
IC	36.95		31.80
CR	9.47	52.93	
MBEA	6.46	8.01	
MBEP	0.71	5.68	
LF	14.69	37.39	

Additionally, the error-covariance matrix had large modification indices related to the error covariances between IIB and IM (MI = 88.67) and between MBEP and LF (MI = 104.66). These were also considered in the model respecification.

Aish and Jöreskog (1990), Byrne (1998), and Jöreskog and Sörbom (2000b) note that when a confirmatory factor analysis is rejected, any further analyses become exploratory. In any respecification of the model, the analyses continue to use confirmatory factor analysis procedures. However, these analyses are considered exploratory since they focus on identification of parameters that are causing the poor fit.

Byrne (1998), Anderson and Gerbing (1988), Kelloway (1998), Jöreskog (1993) and Kline (1998) advise against making post hoc model modifications, especially without another sample available for cross-validation and when the theory does not support the changes. Additionally, Kline (1998) agrees with Anderson and Gerbing (1988) that unidimensional measurement models are more useful for the interpretation of latent variables since they allow more precise tests of the convergent and discriminant validity of the indicators (pp. 200-201). And Kline (1998) further states that if every indicator was specified to load on all the latent factors, then the entire model would become an exploratory factor analysis model (p. 201). Thus, revised models 1-5, shown in Table 4.16, are considered as exploratory factor analysis models.

Model Respecification for Group 1 Faculty

From Table 4.12 above, all standardized parameter estimates (factor loadings) were greater than the absolute value of 0.60 with the exception of MBEA. Since MBEA had a -0.06 loading and was not significant, it was deleted for revised model 1. All revised models were nested under revised model 1.

Respecification of the model was done by examining which of the above mentioned modifications to use in order to obtain a substantial model fit improvement to the data. With the deletion of MBEA, we again have nested models represented by forms of transformational and transactional leadership under revised model 1.

The augmentation effect (Bass, 1985) allowed additional parameters to be estimated in establishing the form of the relationship of leadership for technical-

vocational deans. In 1985, Bass proposed that transformational leadership augments the effects of transactional leadership. Higher levels of outcomes are reported for the augmentation effect (Avolio, Bass, & Yammarino, 1991; Howell & Avolio, 1993; Seltzer & Bass, 1990; Waldman & Bass, 1986; Waldman, Bass, & Yammarino, 1990). Thus, the full range of leadership model is achieved through elements of both, not one or the other of the dichotomous forms of leadership. Several sequences of revised models were examined, all resulting in an improvement of fit.

By dropping management-by-exception active, the data and the parameters were changed and the model was no longer nested under the 3-factor oblique model. Therefore, the chi-square difference test with the 3-factor oblique model was no longer appropriate. Since, the subsequent revised models are nested under revised model 1, chi-squared difference test with revised models were calculated. For revised model 2, parameters set free to be estimated were outcomes to IIA. Another parameter, transformational to IC was fixed to 0. Finally, parameters were set free transactional to IC, MBEP, and LF. This combination resulted in revised model 2 with a better fit. Specifically, $\chi^2(40, N=481) = 261.93$, $p<0.01$. The GFI was 0.91 and the AGFI was 0.85. The RMSEA is 0.11. The NFI and CFI are greater than 0.95. These fit indices can be seen as revised model 2 in Table 4:20. Another revised model 3, with good fit, was achieved by allowing an indicator error to correlate. The residuals suggested that a significant improvement in χ^2 could be achieved if the errors from IM to IIB were allowed to correlate. Allowing the error to correlate between IIB and IM resulted in revised model 3. These results are included in Table 4:16. The researcher decided to

include this model since the same results (residuals suggested allowing IM and IIB to correlate) from the residuals were found in four of the six groups. It was interesting that the same result was found in the four of the six groups: (1) faculty; (3) male faculty; (4) female faculty; and (6) female deans. However, Jöreskog and Sörbom, (1996b) are very clear in stating:

> In cross-sectional studies, the error terms should be uncorrelated from one indicator to another. This is part of the definition of indicators of a construct. Because, if the error terms for two or more indicators correlate, it means that the indicators measure *something else* or *something in addition* to the construct they are supposed to measure. If this is the case, the meaning of the construct and its dimensions may be different from what is intended. It is a widespread misuse of structural equation modeling to include correlated error terms in the model for the sole purpose of obtaining a better fit to the data. (p. 113)

The error covariances listed also are congruent with the largest residuals given in the output of LISREL 8.30. Since the MLQ-5X is a measuring instrument for leadership, these error covariances represented systematic, rather than random, measurement error in the item responses. This systematic measurement error could be related to characteristics in either the items or to the respondents (Aish & Jöreskog, 1990). More accurately, the systematic measurement error could be due to possibility of another question that might measure the indicator more accurately or to respondents bias in a self-report instrument. Also, it could also be due to an elevated degree of overlap in item content. Byrne (1998) says "Such redundancy occurs when an item, although worded differently, essentially asks the same question" (p. 147). From examining the statements for MBEP and LF, this seems to be a consideration. The error covariance between IIB and IM is supported by

Bass and Avolio (1997) where IM could possibly overlap with IIB and IIA depending upon how much the faculty seeks to identify with the deans.

Revised models 1 through 5 were considered with allowing cross-loadings and correlated errors. However, it can be seen in Table 4.15, that this was at the expense of a parsimonious model. Based on the discussion above, the revised model 5 was decided upon for a more parsimonious model. This revised model consisted of no cross-loadings and allowing the errors between MBEP and LF to covary as well as the error covariances between IM and IIB.

The revised measurement model 5 can be seen in Figure 4.6. The standardized parameter estimates for the revised model are in Table 4.16. Following is Table 4.17 with the interfactor correlations.

Other Group Model Respecifications

A similar process was followed for the models for female faculty, male faculty, deans, male deans, and female deans. The same structure as seen in the final measurement model (Figure 4.7) was held for the female faculty and the male faculty. Results for the male faculty can be viewed in Table 4.18. Results for the female faculty can be seen in Table 4.19.

Table 4.15 Initial and Revised Measurement Model Fit Indices for Group 1 Faculty

Model	χ^2	df	CAIC	GFI	AGFI	RMSEA	NFI	CFI	PNFI	PGFI
Independence model with no indicators deleted	5756.76	66								
1. 3-factor oblique	401.98	51	624.07	.87	.80	.12	.93	.94	.72	.57
2. 3-factor orthogonal	1759.01	54	1469.14	.69	.55	.22	.69	.70	.57	.48
3. 2-factor oblique	452.37	53	682.39	.85	.78	.13	.92	.93	.74	.58
4. 2-factor orthogonal	1266.54	54	955.32	.79	.69	.17	.78	.79	.64	.54
5. 1-factor	574.32	54	860.06	.81	.72	.16	.90	.91	.74	.56
Independence model with MBEA indicator deleted and with/without correlated errors and cross loadings	5698.78	55								
6. Revised model 1	345.72	41	543.02	.88	.81	.13	.94	.95	.70	.55
6. Revised model 2	261.93	40	448.32	.91	.85	.11	.95	.96	.69	.55
7. Revised model 3	108.26	38	310.22	.96	.93	.063	.98	.99	.68	.55
8. Revised model 4	61.33	37	267.14	.98	.96	.035	.99	1.00	.67	.55
10. Revised and final model 5	145.40	39	343.98	.95	.91	.077	.97	.98	.69	.56

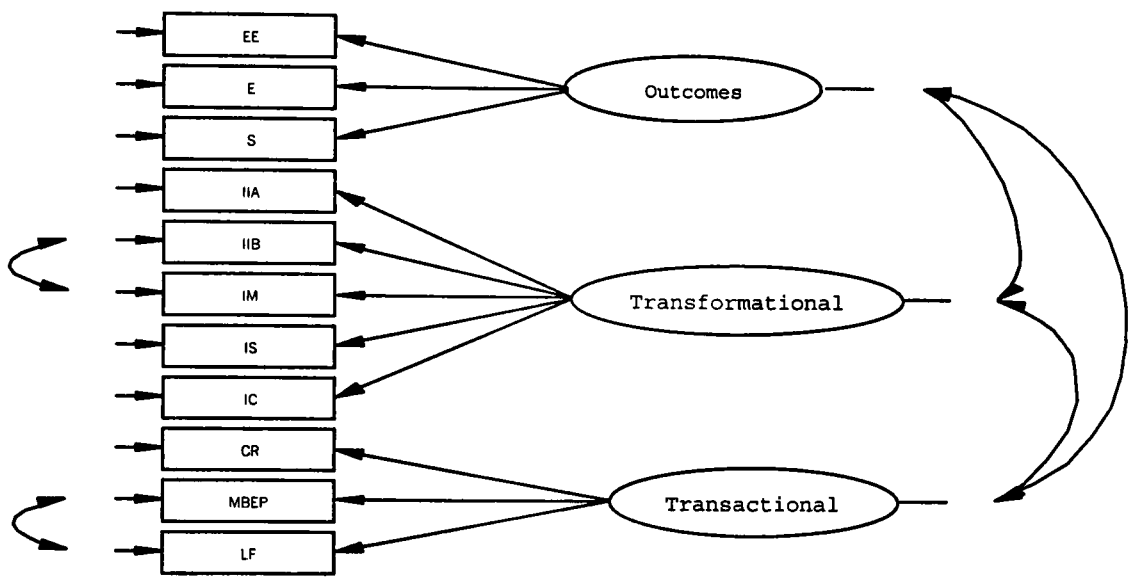

Figure 4.6: Final Measurement Model for Faculty

Table 4.16: Standardized Parameter Estimates for Revised Model 5 - Group 1 Faculty

Indicator	Outcomes	Transformational	Transactional	R^2
EE	.89			.79
E	.96			.92
S	.95			.90
IIA		.93		.86
IIB		.77		.60
IM		.84		.71
IS		.83		.69
IC		.86		.75
CR			.89	.79
MBEP			-.57	.33
LF			-.71	.50

Table 4.17: Interfactor Correlations for Final Model - Group 1 Faculty

	Outcomes	Transformational	Transactional
Outcomes	1.00		
Transformational	0.94	1.00	
Transactional	0.98	0.98	1.00

Table 4:18: Initial and Revised Measurement Model Fit Indices for Group 2 Male Faculty

Model	χ^2	df	CAIC	GFI	AGFI	RMSEA	NFI	CFI	PNFI	PGFI
Independence model with no indicators deleted	3385.1	66								
1. 3-factor oblique	255.39	51	473.20	.85	.77	.13	.92	.94	.71	.55
2. 3-factor orthogonal	1027.62	54	913.29	.69	.55	.22	.70	.71	.57	.48
3. 2-factor oblique	290.86	53	516.61	.82	.74	.14	.91	.93	.73	.56
4. 2-factor orthogonal	749.25	54	633.93	.78	.68	.17	.78	.79	.64	.54
5. 1-factor	363.79	54	636.05	.78	.68	.17	.89	.91	.73	.54
Independence model with MBEA indicator deleted and with/without correlated errors and cross loadings	3343.26	55								
6. Revised model 1	214.42	41	401.10	.87	.78	.13	.94	.95	.70	.54
7. Revised model 2	156.74	40	334.26	.90	.84	.11	.95	.96	.69	.55
8. Revised model 3	80.23	38	266.91	.95	.91	.065	.98	.99	.67	.55
9. Revised model 4	49.36	37	240.54	.97	.94	.034	.99	1.00	.66	.54
10. Revised and final model 5	114.98	39	302.41	.92	.87	.089	.97	.98	.68	.55

Table 4:19: Initial and Revised Measurement Model Fit Indices for Group 3 Female Faculty

Model	χ^2	df	CAIC	GFI	AGFI	RMSEA	NFI	CFI	PNFI	PGFI
Independence model with no indicators deleted	2463.45	66								
1. 3-factor oblique	210.14	51	370.71	.86	.78	.12	.91	.93	.71	.56
2. 3-factor orthogonal	803.95	54	747.76	.67	.53	.22	.67	.69	.55	.46
3. 2-factor oblique	224.11	53	2539.27	.85	.78	.12	.91	.93	.73	.58
4. 2-factor orthogonal	576.40	54	373.42	.77	.67	.17	.77	.78	.63	.54
5. 1-factor	275.76	54	433.22	.81	.73	.14	.89	.91	.73	.56
Independence model with MBEA indicator deleted and with/without correlated errors and cross loadings	2423.66	55								
6. Revised model 1	181.19	41	332.81	.86	.78	.13	.93	.94	.69	.54
7. Revised model 2	159.38	40	321.64	.88	.80	.12	.93	.95	.68	.53
8. Revised model 3	79.55	38	254.05	.94	.89	.071	.97	.98	.67	.54
9. Revised model 4	62.51	37	242.77	.95	.91	.055	.97	.99	.66	.53
10. Revised and final model 5	85.33	39	252.54	.93	.88	.074	.96	.98	.68	.55

In the deans group, the final revised models contained no cross loadings. An error covariance was allowed between IS and IC. The final revised measurement model for the deans can be viewed in Figure 4.7. Table 4.20, Table 4.21, and Table 4.22 contain the results for all the deans, the male deans and the female deans, respectively.

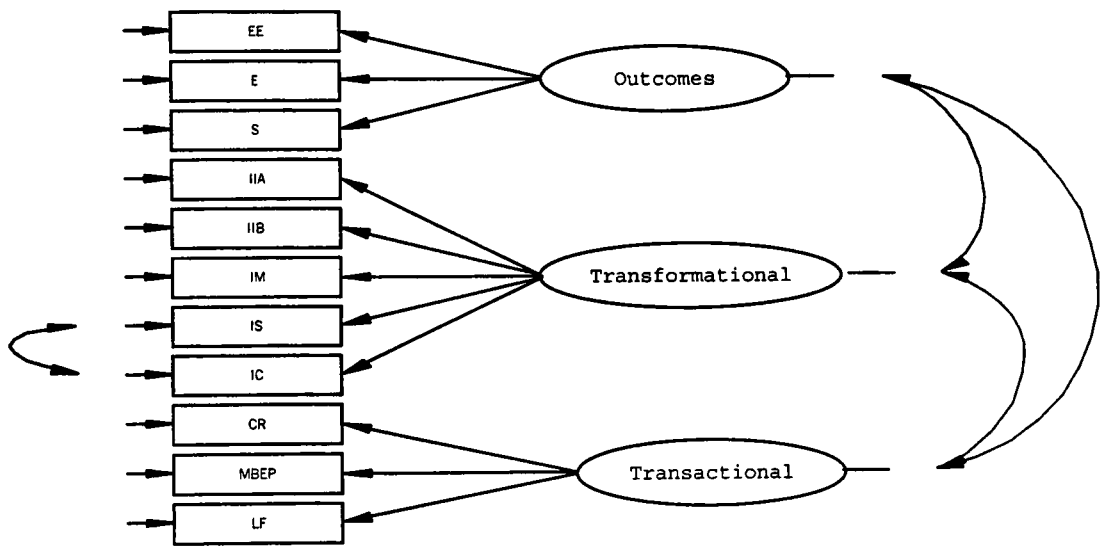

Figure 4.7: Final Measurement Model for Deans

Table 4:20: Initial and Revised Measurement Model Fit Indices for Group 4 Deans

Model	χ^2	df	CAIC	GFI	AGFI	RMSEA	NFI	CFI	PNFI	PGFI
Independence model with no indicators deleted	801.58	66								
1. 3-factor oblique	93.58	51	249.65	.90	.84	.077	.88	.94	.68	.59
2. 3-factor orthogonal	293.98	54	404.85	.75	.64	.17	.63	.67	.52	.52
3. 2-factor oblique	94.88	53	237.99	.90	.85	.074	.88	.94	.71	.61
4. 2-factor orthogonal	233.67	54	312.80	.82	.74	.13	.71	.76	.58	.57
5. 1-factor	108.63	54	246.15	.88	.83	.085	.86	.93	.71	.61
Independence model with MBEA indicator deleted and with/without correlated errors and cross loadings	768.94	55								
6. Revised model 1	73.85	41	218.24	.91	.86	.075	.90	.95	.67	.57
7. Revised model 2	57.80	32	189.79	.92	.87	.073	.92	.96	.65	.54
8. Revised model 3	52.18	31	188.07	.93	.88	.063	.93	.97	.64	.53
9. Revised model 4	51.23	31	190.49	.93	.88	.067	.93	.97	.64	.52
10. Revised and final model 5	59.75	40	214.86	.92	.87	.065	.92	.97	.67	.56

Table 4.21: Initial and Revised Measurement Model Fit Indices for Group 5 Male Deans

Model	χ^2	df	CAIC	GFI	AGFI	RMSEA	NFI	CFI	PNFI	PGFI
Independence model with no indicators deleted	442.68	66								
1. 3-factor oblique	88.87	51	239.25	.86	.79	.089	.80	.90	.62	.57
2. 3-factor orthogonal	182.51	54	310.80	.76	.66	.16	.59	.66	.48	.53
3. 2-factor oblique	89.89	53	228.02	.87	.80	.084	.80	.90	.64	.59
4. 2-factor orthogonal	162.43	54	272.36	.80	.72	.13	.63	.71	.52	.56
5. 1-factor	100.17	54	229.88	.86	.79	.091	.77	.88	.63	.59
Independence model with MBEA indicator deleted and with/without correlated errors and cross loadings	426.93	55								
6. Revised model 1	73.96	41	214.21	.87	.80	.094	.83	.91	.62	.54
7. Revised model 2	56.80	32	188.24	.89	.81	.096	.86	.93	.61	.52
8. Revised model 3	52.98	31	186.78	.90	.82	.087	.87	.94	.60	.51
9. Revised model 4	49.56	31	184.51	.90	.83	.082	.88	.95	.60	.51
10. Revised and final model 5	68.15	40	215.90	.88	.80	.091	.84	.92	.61	.53

Table 4:22: Initial and Revised Measurement Model Fit Indices for Group 6 Female Deans

Model	χ^2	df	CAIC	GFI	AGFI	RMSEA	NFI	CFI	PNFI	PGFI
Independence model with no indicators deleted	448.28	66								
1. 3-factor oblique	123.15	51	214.43	.66	.47	.17	.73	.81	.56	.43
2. 3-factor orthogonal	198.93	54	235.37	.58	.40	.22	.56	.62	.46	.40
3. 2-factor oblique	126.26	53	206.94	.65	.49	.16	.72	.81	.58	.44
4. 2-factor orthogonal	173.78	54	213.30	.63	.46	.18	.61	.69	.50	.43
5. 1-factor	132.94	54	210.53	.63	.47	.18	.70	.79	.58	.44
Independence model with MBEA indicator deleted and with/without correlated errors and cross loadings	407.05	55								
6. Revised model 1	101.74	41	185.65	.69	.50	.17	.75	.83	.56	.43
7. Revised model 2	73.89	32	153.75	.74	.56	.14	.80	.87	.57	.43
8. Revised model 3	70.65	31	155.38	.75	.56	.14	.81	.88	.56	.42
9. Revised model 4	73.88	31	157.73	.75	.55	.15	.80	.87	.55	.42
10. Revised and final model 5	97.38	40	188.61	.69	.49	.17	.76	.84	.55	.42

Each of the six final measurement models with the completely standardized solution can be seen in Figure 4.8 through Figure 4.12.

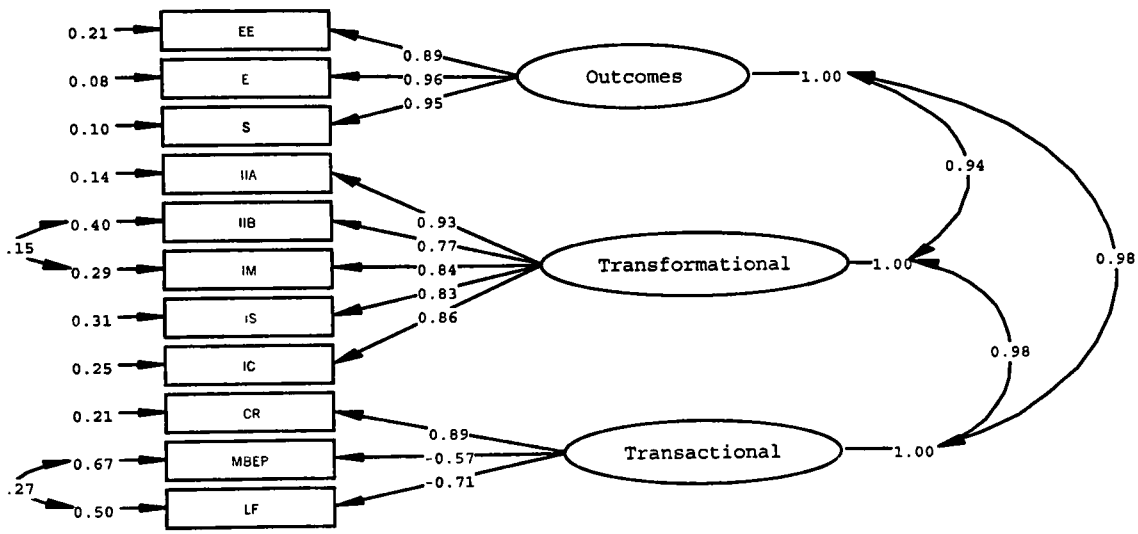

Figure 4.8: Final Measurement Model--Group 1 Faculty
Completely Standardized Solution

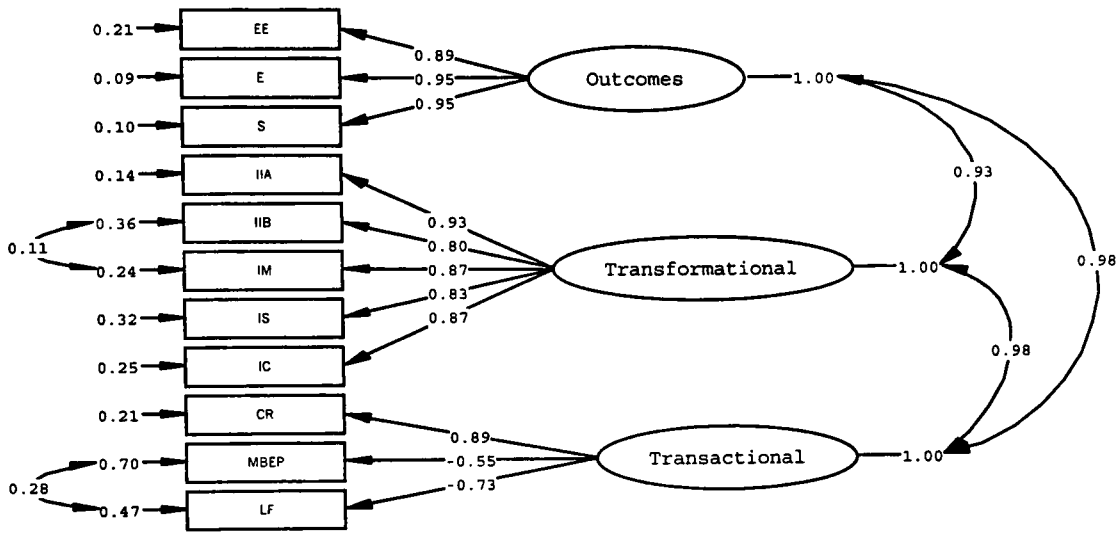

Figure 4.9 Final Measurement Model--Group 2 Male Faculty
Completely Standardized Solution

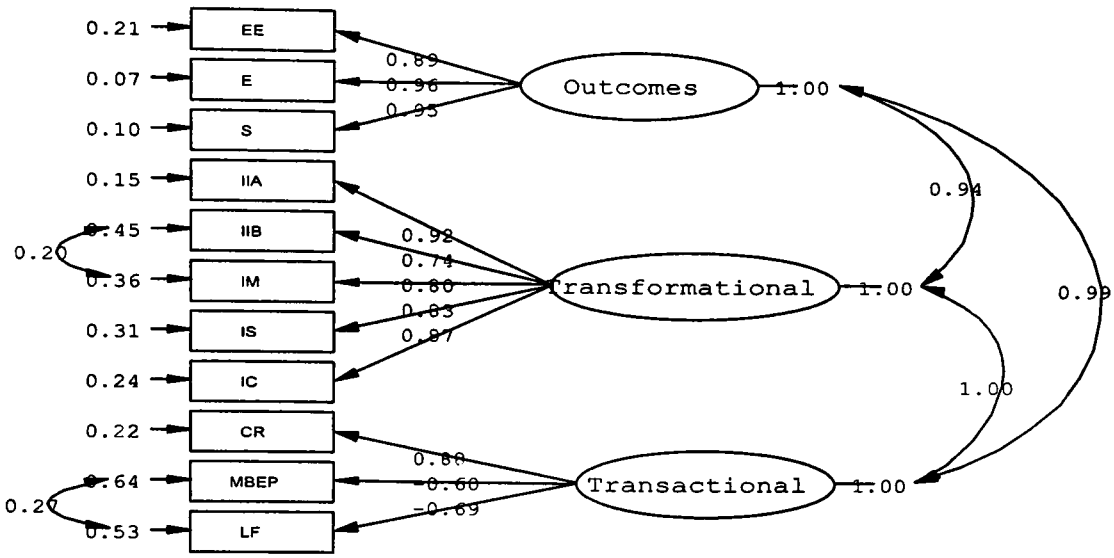

Figure 4.10 Final Measurement Model--Group 3 Female Faculty
Completely Standardized Solution

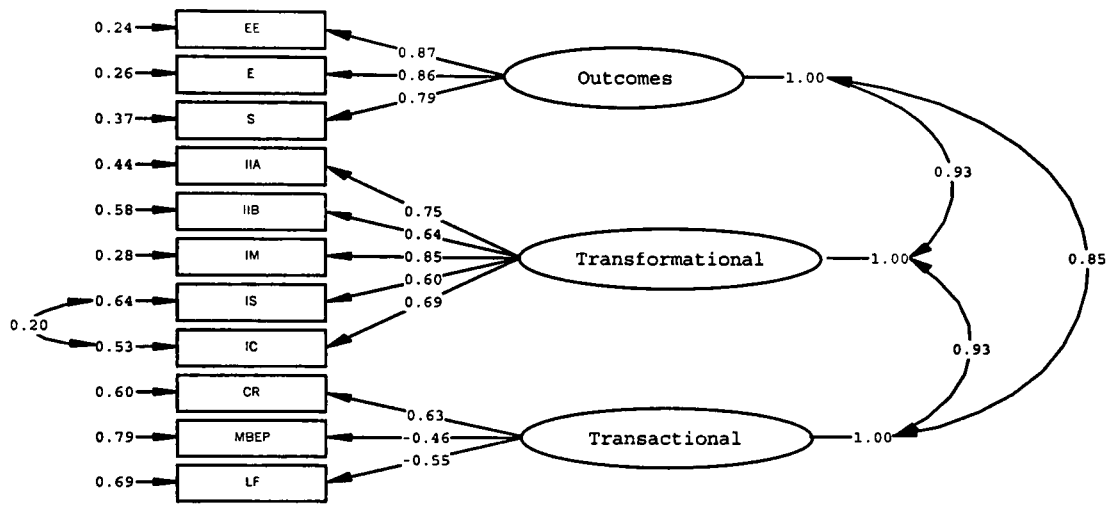

Figure 4.11 Final Measurement Model--Group 4 Deans
Completely Standardized Solution

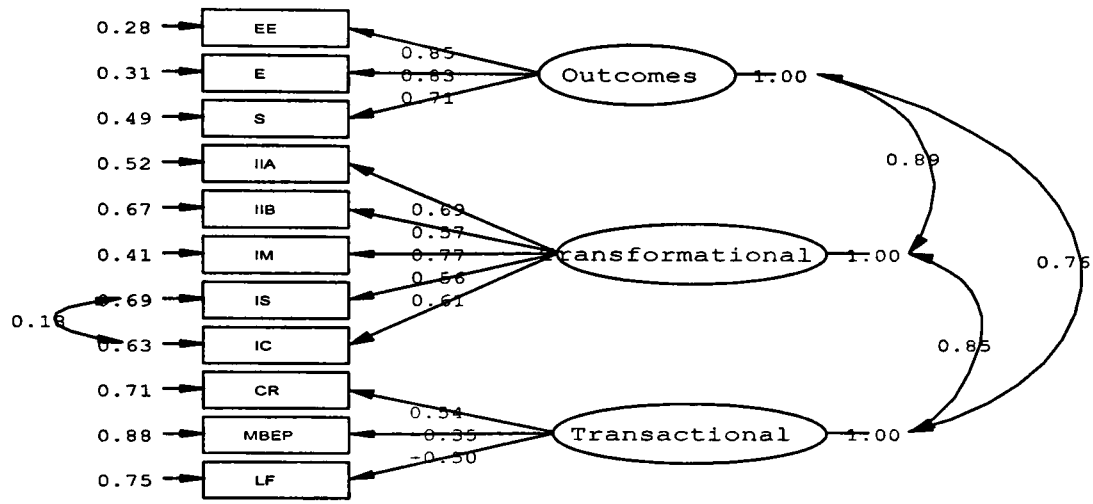

Figure 4.12 Final Measurement Model--Group 5 Male Deans
Completely Standardized Solution

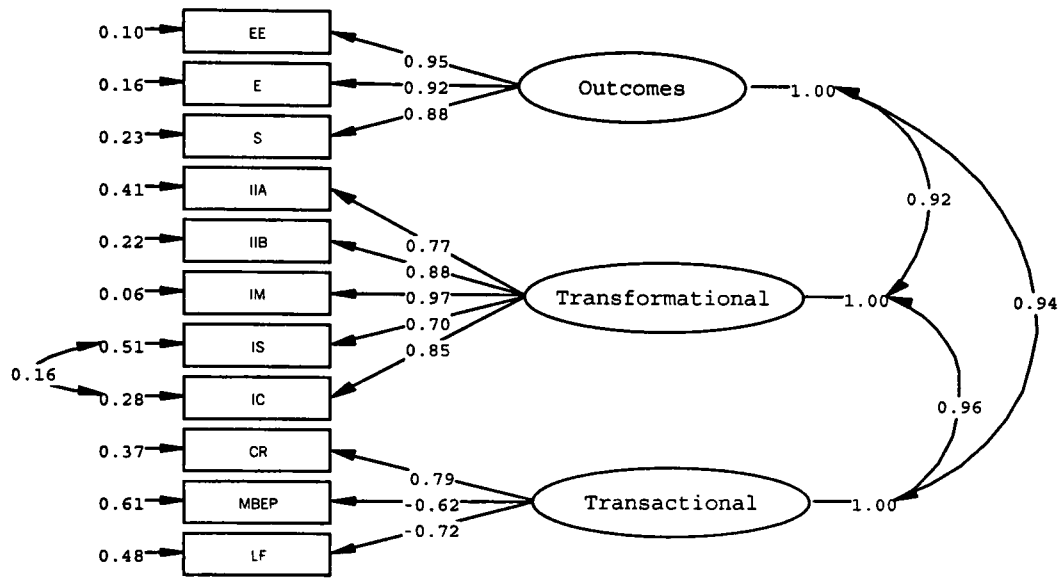

Figure 4.13 Final Measurement Model--Group 6 Female Deans
Completely Standardized Solution

The Full Structural Equation Model

The confirmatory factor analysis models presented earlier comprised only measurement models. The hypothesized model for the full structural equation model (SEM) is seen in Figure 4.14. The full SEM includes an X-model (Figure 4.15), a Y-model (Figure 4.16), and a structural model (Figure 4.17). The hypothesized model for SEM is the same for the faculty and the deans.

The structural portion of a full structural equation model involves relationships among only the latent variables, transformational leadership, transactional leadership, and faculty outcomes. Similar to the earlier models, the validity of the measurement model was established for the full latent model through confirmatory factory analysis.

The full SEM final leadership model was model 4. In models 2 and 3, which the researcher examined, all resulted in lower χ^2 and RMSEA. However, the Expected Cross-Validation Index (ECVI) dropped dramatically with model 3 and 4. The ECVI is a way to appraise, from a single sample, the likelihood that the model will cross-validate with a similar size sample from the same population (Byrne, 1998, p. 113, from Browne & Cudeck, 1989). A smaller value is required for this index. Since there was little difference between model 3 and 4, the final model became 4 because it is the most parsimonious of the two models. This model can be seen in Figure 4.20.

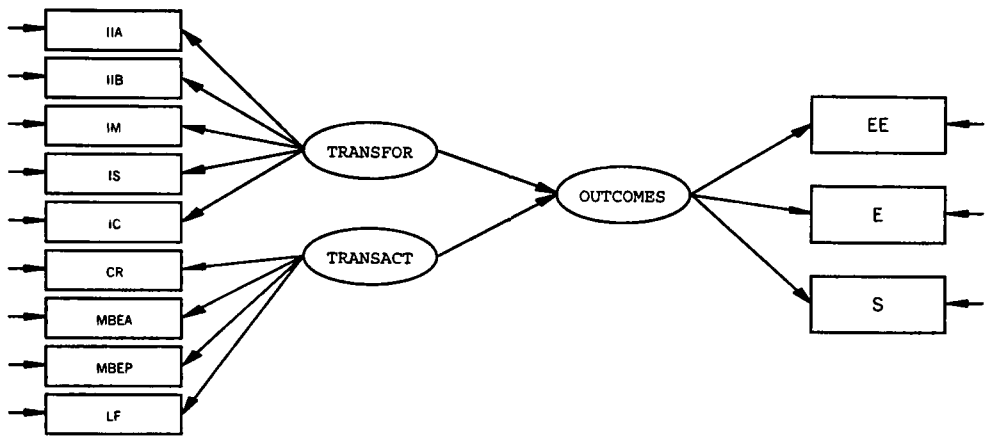

Figure 4.14 Theoretical MLQ-5X for the Full Range of Leadership Model

IIA - Idealized influence attributed
IIB - Idealized influence behavior
IM - Inspirational Motivation
IS - Intellectual Stimulation
IC - Individual Consideration
CR - Contingent Reward
EE - Extra Effort
S - Satisfaction
MBEA - Management-by-Exception Active
MBEP - Management-by-Exception Passive
LF - Laissez-faire
TRANSFOR - Transformational leadership
TRANSACT - Transactional leadership
OUTCOMES - Faculty outcomes
E - Effectiveness

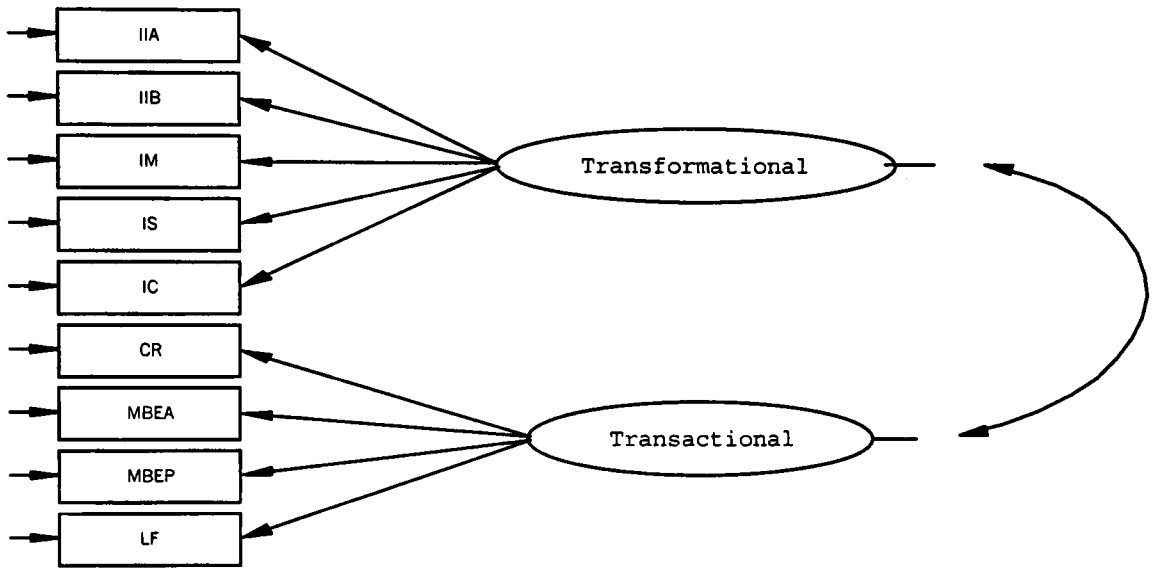

Figure 4.15 The X-Model

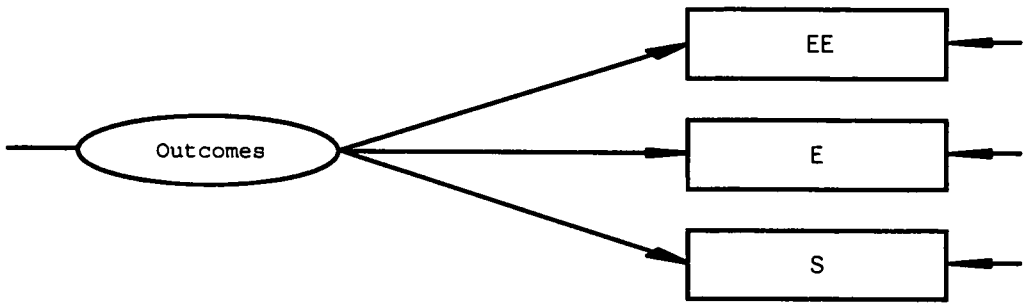

Figure 4.16 The Y-Model

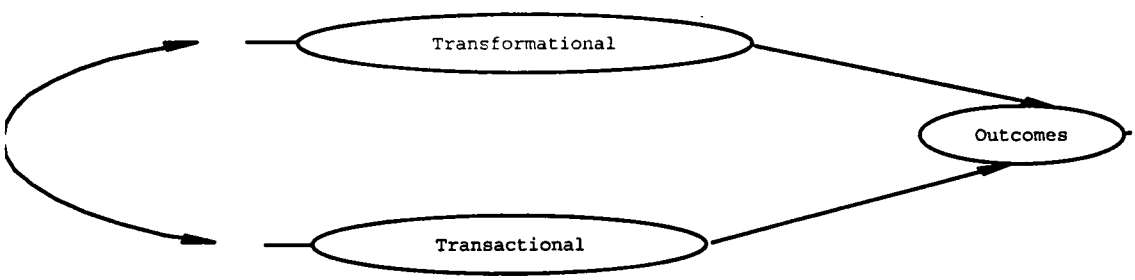

Figure 4.17 The Structural Model

Table 4.23: Summary of Specifications and Fit Statistics for Tested Models of Leadership for Faculty

Model	Parameter Added	Parameter Deleted	χ^2	df	CFI	ECVI	RMSEA	$\Delta\chi^2$	Δdf
1. Initial	-----		345.72	41	.95	.86	.13	---	---
2.	TD(3,2)		256.65	40	.96	.65	.11	89.07	1
3.	LX(6,1)		122.64	39	.99	.37	.068	134.01	1
4. Final		LX(6,2)	128.43	40	.98	.38	.069	128.22	1

Table 4.24: Summary of Specifications and Fit Statistics for Tested Models of Leadership for Deans

Model	Parameter Added	Parameter Deleted	χ^2	df	CFI	ECVI	RMSEA	$\Delta\chi^2$	Δdf
1. Initial	-----		73.85	41	.95	.92	.075	—	—
2. Final	TD(5,4)		59.75	40	.97	.87	.065	14.1	1

The model chosen for the Deans is represented in Figure 4.21.

Testing for Invariance Across Gender

In testing for the invariance of leadership across gender, four hypotheses were considered: (a) that the number of underlying factors of leadership were equivalent; (b) that the pattern of factor loadings were equivalent; (c) that structural relations were equivalent; and (d) that the error variances and covariances were equivalent. The models used to establish a baseline are the ones in Figures 4.10, 4.11, 4.13, and 4.14.

In testing that the leadership structure was described best by transformational leadership, transactional leadership, and perceived faculty outcomes involved testing both female faculty and male faculty groups simultaneously. LISREL 8.30 (Jöreskog & Sörbom, 2000b), provides one set of fit statistics for multigroup analyses.

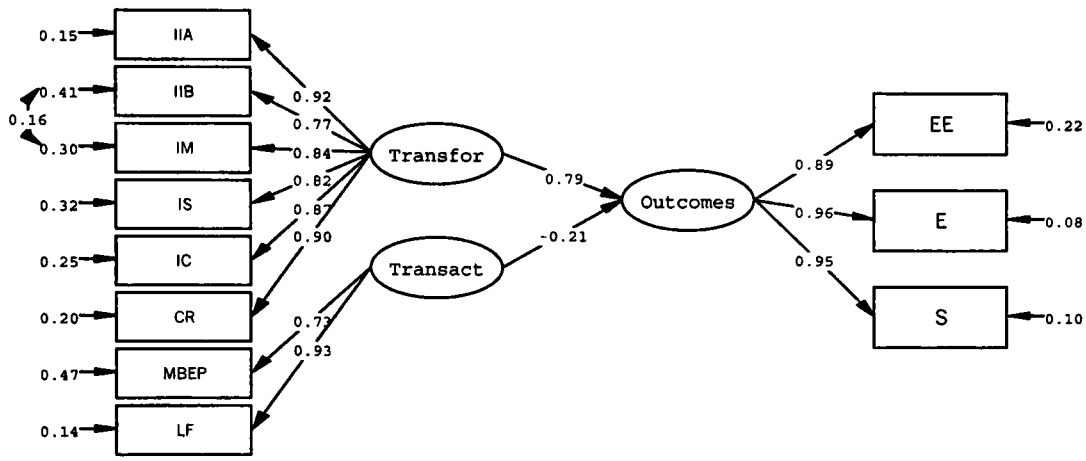

Figure 4.18: Standardized Solution for Leadership Structural Equation Model for Faculty

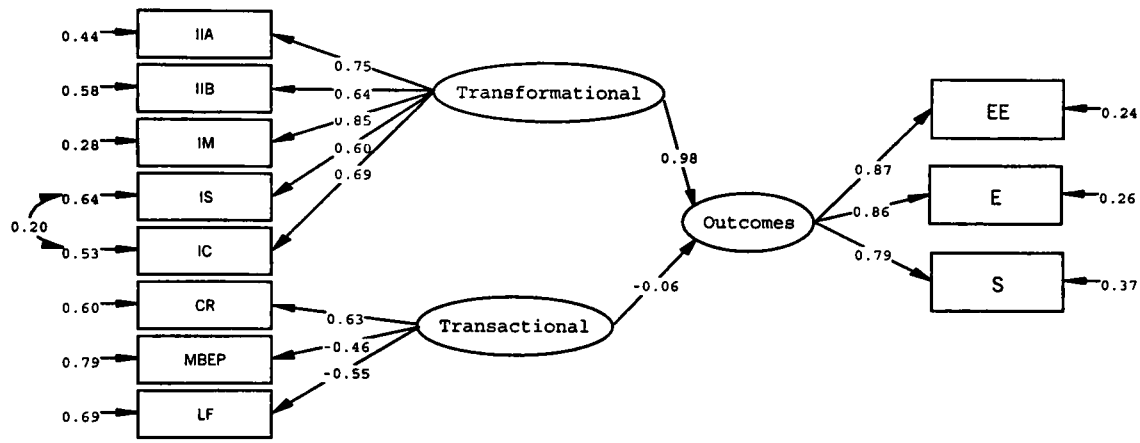

Figure 4.19: Standardized Solution for Leadership Structural Equation Model for Deans

All the results for the tests are given in Table 4.25 and Table 4.26.

Table 4.25: Summary of Tests for Invariance of Gender for Faculty

Competing Models	χ^2	df	χ^2/df	$\Delta\chi^2$	Δdf	$\Delta\chi^2/\Delta$df	ECVI	NFI	CFI
1. Factors invariant	193.01	78	2.47	–	–	–	0.65	0.97	0.98
2. Factor variances and covariances invariant	194.86	84	2.31	1.85	6	0.31	0.62	0.97	0.98
3. Factors invariant and errors invariant	202.81	89	2.28	9.8	11	0.89	0.62	0.96	0.98
4. Factors invariant, errors invariant, and variances and covariances invariant	204.14	95	2.15	11.13	17	0.66	0.59	0.96	0.98

Table 4.26: Summary of Tests for Invariance of Gender for Deans

Competing Models	χ^2	df	χ^2/df	$\Delta\chi^2$	Δdf	$\Delta\chi^2/\Delta$df	ECVI	NFI	CFI
1. Factors invariant	186.83	80	2.29	–	–	–	2.05	0.77	0.85
2. Factor variances and covariances invariant	196.54	86	2.34	9.71	6	1.62	2.00	0.78	0.86
3. Factors invariant and errors invariant	195.61	91	2.15	8.78	11	0.79	1.92	0.77	0.86
4. Factors invariant, errors invariant, and variances and covariances invariant	207.12	97	2.14	20.29	17	1.19	1.93	0.76	0.85

Summary

Chapter four described the research results of data collected from a national sample of single campus technical-vocational deans in community colleges. Six research questions were posed. Structural equation modeling was employed to provide a strong statistical study of these questions. Although the response rate was 35.2%, over sampling was used in this study to ensure enough returns to use structural equation modeling. The response rate was large enough to consider the generalizability of the results. Missing data appeared to be a problem in this study. However, after statistical considerations, missing data was treated adequately for this study. Extensive descriptive statistics was done to begin a knowledge base for the technical-vocational dean and their faculty. These were explored by personal characteristics, job characteristics, and perceived community participation. Also, gender specific descriptive statistics were provided. After extensive screening by PRELIS 2.30 (Jöreskog & Sörbom, 1997), the hypothesized model was described. This model was from Bass and Avolio (1997) theory of leadership styles. Confirmatory factor analysis was performed, where the results rejected the hypothesized model. At this point we could have concluded the research, however LISREL 8.30 (Jöreskog & Sörbom, 2000) provided extensive modification indices that indicated where the model needed to be revised. These were explored, realizing since the modifications were data-driven, cross-validation would be needed in another study. Once a model was determined, then path analysis proceeded. These results were described. Multigroup analyses proceeded across the groups of gender for deans and for faculty. This leads us to Chapter V for the discussion of these results and recommendations for research.

CHAPTER V

DISCUSSION AND CONCLUSIONS

Introduction

The purpose of Chapter V is to summarize this study and to draw conclusions. Chapter V contains the following sections: (1) Summary of the Study; (2) Summary and Discussion of Findings; and (3) Recommendations for Future Research.

Summary of the Study

The primary purpose of the study was to build a knowledge base about community college technical-vocational deans and their faculty. This was accomplished through testing the Full Range of Leadership model styles and faculty outcomes. Using structural equation modeling and descriptive statistics, this research: (1) described the leadership style of the deans; (2) described the faculty's perceived leadership style of the dean; (3) determined the best-fitting models for the deans and their faculty; (4) testing the best-fitting model across the variable of gender for the deans and for the faculty; and (5) provided a profile of the technical-vocational deans and of their faculty.

The theoretical framework for this study came from Bass and Avolio's (1997) Full Range of Leadership model. This model is useful for examining the transformational, transactional and nontransactional factors related to effective leadership.

To accomplish the purposes of this study, survey research was employed to collect quantitative data. This data was then analyzed to develop a knowledge base about community college technical-vocational deans and their faculty. This knowledge base includes: (1) profiles of the deans and their faculty; (2) self-report leadership styles of the deans; and (3) faculty perceived leadership styles of the deans. For this, the Multifactor Leadership Questionnaire 5X Revised Short Form (Bass & Avolio, 1997), and a demographic questionnaire designed by the researcher, was used to address the objectives and research questions of this study.

The target population included 598 single campus community colleges. A random sample of 398 were selected. Three waves of surveys were mailed to ensure the highest response rate possible. Two of the waves were accomplished by regular mail and the third by email. The number of responses necessary for SEM were achieved through over sampling. Through over sampling, a minimum of 120 responses were needed, which represented a 30.1% response rate. A total of 140 responses were returned, representing a 35.2% response rate. A total of 140 responses were returned, representing a 35.2% response rate.

Leadership styles of community college technical-vocational deans of American single campus community colleges was described and the relationship of gender associated with leadership style was explored.

To address the objectives of the study, the following research questions were asked:

RQ1: What is the profile of the single campus community college technical-vocational dean and their faculty?

RQ2: What is the faculty-perceived leadership style of the technical-vocational dean as measured by the Full Range of Leadership Model?

RQ3: What is the self-perceived leadership style of the technical-vocational dean as measured by the Full Range of Leadership Model?

RQ4: Does the faculty-perceived leadership style have an impact on their perception of faculty outcomes?

RQ5: Does the dean's self-perceived leadership style of the dean have an impact on their outcomes?

RQ6: Does gender affect leadership style and faculty outcomes?

A fundamental assertion of this research project was the need to establish a profile of community college technical-vocational deans and their leadership style. Seagren et al. (1994) study had several implications, one of which was to study the leadership styles of community college chairs. A well-known instrument, the MLQ-5X Short (Revised), measures the Full Range of Leadership model (Bass & Avolio, 1990). However, with the stakeholder base community college technical-vocational divisions have, coupled with the sparse literature on only the deans of these divisions, the study was important.

Summary and Discussion of Findings

Two of the research questions directing this study attempted to determine the profile of the community college technical-vocational dean and their faculty and determine the dean's leadership style. A third research question attempted to determine if gender had an impact on leadership style. Three additional research questions attempted to discover leadership's impact on the perceived faculty outcomes of willingness to exert extra effort, dean effectiveness, and satisfaction.

The findings related to the dean's leadership style were determined by structural equation modeling. Leadership, as perceived by faculty, for deans was best determined by a three-factor model. An indicator, MBEA, was deleted from the initial model and a path was removed from transactional leadership to CR. Another path was added from Transformational leadership to CR. In addition, two indicators errors, IIB and IM, were allowed to covary. These findings were in keeping with previous research findings (Bass & Avolio, 1990 1994, 1997; Bass, 1990, 1996; Migler, 1991; Nischan, 1997).

Similarly, leadership, as perceived by the deans, was best described by a three-factor model. Two indicators, IS and IC, errors were allowed to covary. Transformational leadership has a positive impact on faculty outcomes of willingness to exert extra effort, perceived dean effectiveness, and faculty satisfaction.

Research Question 1

The first research question sought to determine the profile of the single campus community college technical-vocational dean and their faculty.

Deans

The typical community college technical-vocational dean is a Caucasian male between the ages of 45 and 54 with at least a master's degree. Particularly, in this study, 89.3% were Caucasian and 72.7% were male. This is similar to the Seagren et al. (1994) study where 89% were Caucasian. In the Seagren study, however, there were only 60% male. This difference of nearly 13% can possibly be attributed to the higher number of females in the academic area rather than the technical-vocational area.

In this study, slightly more than 52% were between the ages of 45-54 and 50.8% have a master's degree, while 44.6% have a doctorate. Similarities between this study and the Seagren et al. (1994) study were with about 47% reporting in the 45-54 age range. Contrasted with the Seagren study, were the percentages for degrees. The Seagren study had approximately 59% reporting having a master's degree. A large difference existed between the chairpersons with a doctorate (23%), and the technical-vocational deans with a doctorate (44.6%).

Chairpersons in the Seagren study average salary was between $41,000 and $60,000. Male technical-vocational deans average 6.8 years in their current position and made $66,149. Also, female deans made $62,399 and had been in their current position 4.6 years. At first glance, it appears there is a discrepancy in pay. However, if you consider a 3% raise per year, the female deans pay is equivalent. It appears that the technical-vocational division pays more.

In the Seagren study, 64% reported their title as chair. In this study, nearly 60% reported their title as dean. Compared to chairpersons, nearly 8% more technical-vocational deans have experience working in business and industry.

The faculty reported nearly 10% higher than the deans that the program advisory committees were functioning well. Deans reported almost 8% more than the faculty that they had active articulation agreements. Over 75% of the faculty and deans said their divisions were active with business and industry. The Seagren study found a response difference in the chairpersons perspectives' of job dimensions that were directly related to their program area (Seagren et al. 1994, pp. 108-109). Liberal arts and science's chairperson's responses to items similar to advisory committees and external contacts were seen as unimportant items. Possibly, this could be attributed to the unacknowledged advanced academic skills necessary for today's technical-vocational programs.

Faculty

There are approximately two females for every three males on the technical-vocational faculty. The faculty is 82.6% Caucasian with all major ethnic categories represented within the faculty. The percentage of faculty reporting a master's degree is 55.4%, with 32.3% having a baccalaureate, associate's degree, or a certificate program award.

Over 55% listed their current position as instructor, professor, or associate professor. Slightly more than 80% had experience working in business or industry. More than 72% have worked in business or industry six or more years, with 21.7%

reporting more than 20 years experience. Thirty-six percent (36%) of the faculty's prior position was industry.

In perceived community participation, the faculty perceived the programs having active articulation agreements and the division's activity with business or industry a lower percentage than the deans. However, the faculty did rate higher than the deans that the program advisory committees were functioning well.

Research Questions 2 and 4

Research Question 2 was designed to discover the faculty-perceived leadership style of the technical-vocational dean as measured by the Full Range of Leadership Model. Research Question 4 was needed to determine if the faculty-perceived leadership style had an impact on their outcomes. Path analysis was implemented to test the theoretical model presented in Figure 4.14. The results of this analysis were presented in Chapter 4 and resulted in Figure 4.18, the completely standardized solution for the faculty structural equation model.

The estimates of the standardized factor loadings were useful in determining the relative importance of the indicators of their associated latent factors. The most reliable and strongest indicator of the latent transformational leadership factor was Idealized Influence Attributes (IIA = 0.92). This indicator was followed by Contingent Reward (CR=0.90), Individualized Consideration (IC=0.87), Inspirational Motivation (IM=0.84), Intellectual Stimulation (IS=0.82), and Idealized Influence Behavior (IIB=0.77).

Laissez-faire (LF=0.93) was the strongest indicator for the transactional leadership latent factor followed by Management-by-Exception Passive (MBEP=0.73). The faculty outcomes latent factor had two strong indicators in perceived dean Effectiveness (E=0.96) and Satisfaction (S=0.95). Next was the standardized loading of Willingness to exert extra effort (EE=0.89).

For the structural portion of the Full Range of Leadership Model, the path coefficients provided predictive information. Transformational leadership was predictive of greater faculty outcomes (standardized coefficient = 0.79). Increasing the transactional leadership style lead to fewer perceived faculty outcomes (standardized coefficient = -0.21).

These findings, from the faculty perceptions, indicate that the dean's leadership style was transformational. Further, these findings indicated that the greater the transformational leadership style impacted a greater perceived faculty outcomes. And the greater the amount of transactional leadership, the faculty outcomes were negatively impacted.

Research Questions 3 and 5

The focus of the third research question was on the dean's self-perceived leadership style as measured by the Full Range of Leadership Model. Research Question Five was presented to determine if the dean's self-perceived leadership style has an impact on the faculty outcomes. Path analysis was implemented to test the theoretical model presented in Figure 4.14 for the questionnaires returned by the deans. The results

of this analysis were presented in Chapter 4 and resulted in Figure 4.19, the completely standardized solution for the dean's structural equation model.

The estimates of the standardized factor loadings were useful in determining the relative importance of the indicators of their associated latent factors. The most reliable and strongest indicator of the latent transformational leadership factor was Inspirational Motivation (IM=0.85). Next was Idealized Influence Attributes (IIA=0.75) followed by Individualized Consideration (IC=0.69), Idealized Influence Behavior (IIB=0.64), and Intellectual Stimulation (IS=0.60).

The transactional factor was problematic. Contingent Reward was the only indicator to load positively (CR=0.63) followed by Management-by-exception Passive (MBEP=-0.46) and Laissez-faire (LF=-0.55).

The dean's perceived faculty outcomes had two moderate indicators in perceived faculty willingness to exert extra effort (EE=0.87) and perceived dean effectiveness (E=0.86). This was followed by satisfaction (S=0.79).

For the structural portion of the Full Range of Leadership Model, the path coefficients provided predictive information. Transformational leadership was predictive of greater faculty outcomes (standardized coefficient = 0.98). The transactional leadership factor coefficient was not significant (standardized coefficient = -0.06).

These findings, from the dean's self-perceptions, indicate that the dean's perceive their leadership style as transformational. Further, these findings indicated that the dean's perceived their leadership style as having an impact on the faculty willingness to exert extra effort. The dean's self-perception of their effectiveness is strong.

Research Question 6

Research Question 6 investigated the impact of gender on the leadership structure. The results of the multigroup analyses were given in Chapter 4 in Tables 4.25 and 4.26. These tests are tests of invariance and are increasingly stringent.

For the faculty, the tests revealed the leadership structure to be well defined across both groups of female and male faculty. Model 4 is considered excessively stringent in the literature (Byrne, 1998; and Jöreskog & Sörbom, 2000).

The invariance tests for the dean's were problematic. None of the results were within acceptable limits. This could be due to the small number of females in the dean's sample (N=31) and the number of males (N=101).

Recommendations for Future Research

This study fills a gap in the literature and possibly will begin a base of knowledge on the technical-vocational deans in community colleges. It also begins to answer one of the implications for future research from the Seagren et al. (1994) study, in what types of leadership are most prevalent and effective. Recommendations for future research follow:

- Replicate the study with other types of community colleges.
- Replicate the study with raters at levels above the deans.
- Replicate the study in five years; compare the results and look for changes.

- Explore opportunities to recruit more minorities to more accurately reflect recent census statistics.
- Examine the importance of prior business or industry experience on leadership style.
- Examine the importance of a higher degree on leadership style.

Another weakness in the study leads us to another recommendation for future research. All revised models in this study are of questionable validity, because they resulted from data-driven modifications made to rejected initial models. It is therefore possible that the models will not generalize to other samples or to the population. Therefore, other future recommendations for research involve cross validation through the following: (1) another sample from the same population; or (2) performing Monte Carlo studies.

The Multifactor Leadership Questionnaire 5X Short Form was developed by Bass and Avolio (1997) to study leadership styles. This study specifically targeted the leadership styles of technical-vocational deans in American single campus community colleges. Previous literature had not targeted this area for this population nationally. This study opens a door for further exploration into the leadership styles and the effect on faculty outcomes.

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APPENDIX A
TWENTIETH CENTURY FEDERAL LEGISLATION OR ACTS FOR TECHNICAL-VOCATIONAL EDUCATION

TWENTIETH CENTURY FEDERAL LEGISLATION OR ACTS FOR TECHNICAL-VOCATIONAL EDUCATION

1917 Smith-Hughes Act (PL 64-347)

1918 Smith-Sears Act (PL178)

1920 Vocational Rehabilitation Act

1920 Smith-Bankhead Act (PL 236)

1925 American Vocational Association (AVA) formed

1929 George-Reed Act

1934 George-Ellzey Act

1935 Bankhead-Jones Act

1935 Social Security Act

1935 Works Project Administration and Public Works Administration

1936 George-Deen Act

1940-
1946 Vocational Education for National Defense Acts (10)

1944 Serviceman's Readjustment Act (GI Bill)

1946 George-Barden Act

1956 Health Amendments Act (PL 84-911)
George-Barden Act Fishing Amendment

1958 National Defense Education Act

1961 Area Redevelopment Act (PL 82-27)

1962 Manpower Development and Training Act

1963 Health Professions Educational Assistance Act (PL 88-129)
Vocational Education Act

1964 Economic Opportunity Act (PL 88-452)

1965 Appalachian Regional Development Act (PL 89-4)

1967 Educational Professions Development Act (PL 90-35)

1968 Vocational Amendments

1971 Nurse Training Act (PL 92-158)

1972 Education Amendments

1973 Comprehensive Employment and Training Act

1974 Education Amendments (PL 93-380)
Women's Educational Equality Act

1975 Education of All Handicapped children Act of 1975 (PL 94-142)

1976 Educational Amendments (PL 94-482)
Training and Development Program for Vocational Education Personnel

1978 Career Education Act (PL 95-205)
Comprehensive Employment and Training Amendments of 1978

1982 Job Training Partnership Act

1984 Carl D. Perkins Vocational Education Act

1990 Carl D. Perkins Vocational and Applied Technology Education Act

1992 Job Training Reform Amendments (PL 101-367)

1994 Goals 2000: Educate America Act (PL 103-227)
Improving America's School Act (PL 103-382)
School-to-Work Opportunities Act (PL 103-239)

1998 Carl D. Perkins Vocational & Applied Technology Education Act (PL 105-332)
Workforce Investment Act (PL 105-220)

APPENDIX B
RESPONSE FORM FOR SURVEY INSTRUMENTS AND DEMOGRAPHIC QUESTIONNAIRES

RESPONSE FORM for SURVEY INSTRUMENTS
SINGLE CAMPUS COMMUNITY COLLEGES
LEADERSHIP STYLE OF TECHNICAL-VOCATIONAL DEANS
IMPACT ON OUTCOMES

CODE

LEADER FORM

DIRECTIONS: Please take 15 minutes to complete this response form and return it in the postage-paid business reply envelope provided. It is not necessary to identify yourself by name or institution. The code allows you to remain anonymous and allows the researcher to identify when a sufficient number of responses are returned from each institution. Confidentiality will be maintained.

Your response is needed and a prompt response will be appreciated. **A high return rate is very important to the success of the dissertation study.** Thank you for your cooperation and contribution to this study.

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Continued➞
Distributed by Mind Garden, Inc 1690 Woodside Road Suite 202, Redwood City California 94061 (65) 261-3500
mind garden

DEMOGRAPHIC QUESTIONNAIRE

Answer all applicable questions.

1. What is your current position and title?

   _____

2. Your ethnicity is: Caucasian Hispanic Black Asian Native American Other

3. Your age is _____ 4. Your gender is: Male Female

5. How many years have you been in your current position? _____

6. Did you work in business/industry? Yes No Number of years?_____

7. What is the highest degree you have attained? Please list your area of study.

   Certificate Program Associate Baccalaureate Master's Ed.D. Ph.D.

   _____

8. What is your annual salary?_____

9. What was your position prior to your current position?/ _____

10. What are your professional plans in the next five years?_____

11. Did you work as a faculty member in a community college? Yes No
    Number of years? _____

12. Overall, are your program advisory committees functioning well?
    Yes No Improvement Needed

13. Is your division active with local business/industry? Yes No Improvement Needed

14. Does your division have active articulation agreements with area high schools?
    Yes No Improvement Needed

15. What is the *division* student head-count for Fall 1998? _____

16. What is the *institutional* student head-count for Fall 1998?? _____

RESPONSE FORM for SURVEY INSTRUMENTS

SINGLE CAMPUS COMMUNITY COLLEGES
LEADERSHIP STYLE OF TECHNICAL-VOCATIONAL DEANS
IMPACT ON OUTCOMES

CODE

FACULTY FORM

DIRECTIONS: Please take 15 minutes to complete this response form and return it in the postage-paid business reply envelope provided. It is not necessary to identify yourself by name or institution. The code allows you to remain anonymous and allows the researcher to identify when a sufficient number of responses are returned from each institution. Confidentiality will be maintained.

Your response is needed and a prompt response will be appreciated. **A high return rate is very important to the success of the dissertation study.** Thank you for your cooperation and contribution to this study.

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Distributed by Mind Garden, Inc 1690 Woodside Road Suite 202, Redwood City California 94061 (65) 261-3500
mind garden

DEMOGRAPHIC QUESTIONNAIRE

Answer all applicable questions.

1. What is your current position and title?

   _____

2. Your ethnicity is: Caucasian Hispanic Black Asian Native American Other

3. Your age is _____

4. Your gender is: Male Female

5. How many years have you been in your current position? _____

6. Did you work in business/industry? Yes No Number of years?_____

7. What is the highest degree you have attained? Please list your area of study.

   Certificate Program Associate Baccalaureate Master's Ed.D. Ph.D.

   _____

8. What is your annual salary?_____

9. What was your position prior to your current position?/

   _____

10. What are your professional plans in the next five years?_____

11. Overall, is your program advisory committee functioning well?
    Yes No Improvement Needed

12. Is your division active with local business/industry?
    Yes No Improvement Needed

13. Does your program have active articulation agreements with area high schools?
    Yes No Improvement Needed

14. What is the *program* student head-count for Fall 1998? _____

APPENDIX C
LETTERS

President's Letter

November 11, 1998

FIELD(name)
FIELD(title)
FIELD(address)
FIELD(city), FIELD(state) FIELD(zip)

Dear FIELD(name):

As a doctoral candidate in the Higher Education program at Texas Tech University, I am researching the leadership style of public single campus community college technical-vocational deans (defined as those with direct responsibility for the technical-vocational faculty). Through survey research, I am examining the impact of leadership style on faculty outcomes of satisfaction, willingness to exert extra effort, and perceived dean effectiveness. In addition, I am attempting to determine the best predictors of effective leadership style for this understudied population. Your support of this nationwide project would be most appreciated.

Your technical-vocational division's response is very important. A high return rate is of utmost importance to make valid inferences from the results of this study. Given the need for a base of current knowledge of this population, every response is needed. Confidentiality will be maintained. In no way will the names be revealed nor will the divisions be identified in the results of the study. The response forms that contain the Multifactor Leadership Questionnaire (MLQ) Leader Form or the MLQ Rater Form, and the demographic questions have been coded to protect their identity.

Your support of and advocacy for this project will contribute to a high response rate. Designating a person, other than the dean, to choose the six faculty needed for the study and to encourage them to complete the survey instruments will control bias in reporting. Having a sufficient number of faculty responses is essential in this study as is the dean's response. The MLQ and the demographic questionnaire should take approximately 15-20 minutes to complete. To provide anonyminity, there are two ways the technical-vocational division can reply. One way is to return the completed response form in the postage-paid business reply envelope provided for each individual. The second way is to complete the response form online at http:\\www.math.ttu.edu\~questionnaire. A summary of the results will be available by e-mail, jtemple@math.ttu.edu. Thank you for your consideration of this research.

Sincerely,

Jo Anne Temple	Dr. John Murray	Dr. Arturo Olivarez
Doctoral Candidate	Co-Chair	Co-Chair

Dean and Faculty's Letter

November 11, 1998

Dean and Faculty Members
FIELD(address)_
FIELD(city), FIELD(state) FIELD(zip)_

Dear Dean and Faculty Members:

As a doctoral candidate in the Higher Education program at Texas Tech University, I am researching the leadership style of public single campus community college technical-vocational deans (defined as those with direct responsibility for the technical-vocational faculty). Through survey research, I am examining the impact of leadership style on faculty outcomes of satisfaction, willingness to exert extra effort, and perceived dean effectiveness. In addition, I am attempting to determine the best predictors of effective leadership style for your population. Your support of this nationwide project would be most appreciated.

Your technical-vocational division's response is very important. A high response rate is of utmost importance to make valid inferences from the results of this study. Given the need for a base of current knowledge for your population, every response is needed. Confidentiality will be maintained. In no way will your names be revealed nor will your divisions be identified in the results of the study. The response forms that contain the Multifactor Leadership Questionnaire (MLQ) Leader Form or the MLQ Rater Form, and the demographic questions have been coded to protect your identity.

Your support of and advocacy for this project will contribute to a high response rate. Having a sufficient number of faculty responses is essential in this study as is the dean's response. The MLQ and the demographic questionnaire should take approximately 15-20 minutes to complete. To provide anonyminity, there are two ways your technical-vocational division can reply. One way is to return the completed response form in the postage-paid business reply envelope provided for each individual. The second way is to complete the response form online at http:\\www.math.ttu.edu\~questionnaire. A summary of the results will be available by e-mail, jtemple@math.ttu.edu. Thank you for your consideration of this research.

Sincerely,

Jo Anne Temple Doctoral Candidate	Dr. John Murray Co-Chair	Dr. Arturo Olivarez Co-Chair

APPENDIX D
FOLLOW-UP LETTER

Follow-up letter

DATE
FIELD(name)
FIELD(title)
FIELD(address)
FIELD(city), FIELD(state) FIELD(zip)

Dear FIELD(name):

Thank you for your early advocacy for my study. With your support, I have received [*the required minimum of three (3) faculty questionnaires*] from your institution. Please convey my thanks and appreciation to the individuals taking the time to participate in the study.

To date, I have not received a completed questionnaire from [*the designated leader*]. A complete set of data is one (1) leader and at least three (3) faculty. Without the [*leader*] questionnaire, I do not have a complete set of information from your institution. A complete set is *required* for the methodology of the study.

When the designated [*leader*] responds, Code [# *Z*] must be used on their questionnaire. ***This is very important.*** The Code Number (#) is the only way I can tell that I have a complete set of information from your institution.

Please have your designated leader respond by completing the enclosed questionnaire. An addressed and stamped envelope is provided.

Thank you for your support of and continued advocacy for your institution's participation in this study. I look forward to being able to use information from your institution in my study. I would appreciate receiving the questionnaire by March 1, 1999.

Should you have any questions, please contact me.

Jo Temple, Doctoral Candidate
Department of Mathematics and Statistics
Texas Tech University
P.O. Box 41042
Lubbock, TX 79409-1042
(806) 742-2585 office
(806) 742-1112 fax
jtemple@math.ttu.edu

APPENDIX E
TABLES OF PERSONAL, JOB, AND COMMUNITY CONTACT CHARACTERISTICS BY GENDER

TABLES OF PERSONAL, JOB, AND COMMUNITY CONTACT CHARACTERISTICS BY GENDER

Table E.1: Results of demographic question: Did you work in business/industry?

	Deans			Faculty		
Business/Industry	All	Male	Female	All	Male	Female
Yes	73.3	76.8	64.5	81.8	87.8	73.1
No	26.7	23.2	35.5	18.2	12.2	26.9
Number of years	6.3	7.0	4.8	9.6	11.5	7.2

Table E.2: Results of demographic question: What is your current position and title?

	Deans			Faculty		
Current position	All	Male	Female	All	Male	Female
APIF	0	0	0	14.2	13.1	16.4
PI	2.2	2.0	3.2	43.2	47.7	37.4
CD	0	0	0	15.6	11.7	21.5
CH	15.6	18.2	9.7	23.3	22.3	23.2
Dean	47.4	44.4	51.6	2.5	3.5	1.0
Other	34.8	35.4	35.5	1.2	1.7	0.5

APIF=Associate or Assistant Professor, Instructor or Faculty
PI=Professor/Instructor
CD=Coordinator or Director
CH=Chairperson or Headperson
Dean=Dean

Table E.3: Results of demographic question: What is the highest degree you have attained?

	Deans			Faculty		
Degree	All	Male	Female	All	Male	Female
Certificate Program	0	0	0	2.7	3.9	1.0
Associate's	2.2	3.1	0	9.5	13.3	3.6
Bachelor's	1.5	2.0	0	20.4	20.4	21.3
Master's	50.7	51.0	51.6	58.2	52.0	66.5
Ed.D	26.9	25.5	25.8	3.8	3.2	4.6
Ph.D.	18.7	18.4	22.6	5.4	7.2	3.0

Table E.4: Results of demographic question: What was your position prior to your current position?

	Deans			Faculty		
Current position	All	Male	Female	All	Male	Female
APIF	0	0	0	14.2	13.1	16.4
PI	2.2	2.0	3.2	43.2	47.7	37.4
CD	0	0	0	15.6	11.7	21.5
CH	15.6	18.2	9.7	23.3	22.3	23.2
Dean	47.4	44.4	51.6	2.5	3.5	1.0
Other	34.8	35.4	35.5	1.2	1.7	0.5

APIF=Associate or Assistant Professor, Instructor or Faculty
PI=Professor/Instructor
CD=Coordinator or Director
CH=Chairperson or Headperson
Dean=Dean

Table E.5: Results of demographic question: What are your professional plans in the next five years?

	Deans			Faculty		
Plans	All	Male	Female	All	Male	Female
Administration	0	0	0	4.4	4.9	3.9
Continue in present position	40.2	37.4	45.1	46.0	43.5	49.2
Obtain a higher degree	7.1	7.7	6.4	20.2	18.7	22.7
Improve	9.4	7.7	16.1	8.5	10.2	6.1
Retire	13.4	13.1	9.6	14.5	15.4	13.2
Other	29.9	34.1	22.8	6.4	7.3	4.9

Table E.6: Results of demographic question: Overall, is your program advisory committee functioning well?

	Deans			Faculty		
	All	Male	Female	All	Male	Female
Yes	59.7	60.6	60.0	70.2	69.1	70.8
No	1.5	2.0	0	3.7	5.0	2.1
Improvement Needed	38.8	37.4	40.0	26.1	25.9	27.1

Table E.7: Results of demographic question: Is your division active with local business/industry?

	Deans			Faculty		
	All	Male	Female	All	Male	Female
Yes	81.8	83.8	71.0	77.8	78.9	75.9
No	0.7	0	3.2	4.3	4.6	3.6
Improvement Needed	17.8	16.2	25.8	17.9	16.5	20.5

Table E.8: Results of demographic question: Does your program have active articulation agreements with area high schools?

	Deans			Faculty		
	All	Male	Female	All	Male	Female
Yes	59.7	60.6	60.0	70.2	69.1	70.8
No	1.5	2.0	0	3.7	5.0	2.1
Improvement Needed	38.8	37.4	40.0	26.1	25.9	27.1

APPENDIX F
VARIANCE-COVARIANCE MATRICES

Table F.1: Variance-covariance Matrix - Initial Faculty Measurement Model (N = 481)

	SD	Mean	EE	E	S	IIA	IIB	IM	IS	IC	CR	MBEA	MBEP	LF
EE	1.06	2.83	1.11											
E	0.91	3.12	0.81	0.82										
S	1.00	3.18	0.88	0.83	1.00									
IIA	0.89	3.06	0.75	0.67	0.74	0.80								
IIB	0.83	2.92	0.58	0.50	0.52	0.53	0.68							
IM	0.82	3.22	0.62	0.55	0.58	0.58	0.54	0.66						
IS	0.85	2.78	0.62	0.55	0.60	0.58	0.49	0.50	0.73					
IC	0.91	2.72	0.73	0.67	0.72	0.64	0.49	0.52	0.57	0.83				
CR	0.90	2.99	0.73	0.67	0.73	0.65	0.51	0.55	0.56	0.64	0.81			
MBEA	0.96	1.46	-0.04	-0.08	-0.09	-0.03	0.04	-0.06	0.06	-0.03	0.00	0.93		
MBEP	0.92	1.37	-0.47	-0.46	-0.49	-0.42	-0.31	-0.35	-0.36	-0.38	-0.41	0.14	0.84	0.75
LF	0.87	0.87	-0.56	-0.56	-0.60	-0.49	-0.33	-0.36	-0.38	-0.45	-0.49	0.11	0.54	0.75

SD - Standard Deviation
IIA - Idealized influence attributed
IIB - Idealized influence behavior
IM - Inspirational Motivation
IS - Intellectual Stimulation
IC - Individual Consideration
CR - Contingent Reward
MBEA - Management-by-Exception Active
MBEP - Management-by-Exception Passive
LF - Laissez-faire
TRANSFOR - Transformational leadership
TRANSACT - Transactional leadership
OUTCOMES - Faculty outcomes
S - Satisfaction
E - Effectiveness
EE - Extra Effort

Table F.2: Variance-covariance Matrix - Initial Dean Measurement Model (N = 132)

	SD	Mean	EE	E	S	IIA	IIB	IM	IS	IC	CR	MBEA	MBEP	LF
EE	0.61	3.07	0.38											
E	0.48	3.38	0.22	0.23										
S	0.56	3.35	0.24	0.19	0.32									
IIA	0.52	3.15	0.20	0.15	0.18	0.27								
IIB	0.57	3.23	0.18	0.14	0.13	0.12	0.32							
IM	0.51	3.34	0.21	0.16	0.17	0.16	0.16	0.26						
IS	0.46	3.25	0.15	0.11	0.10	0.09	0.13	0.11	0.21					
IC	0.52	3.35	0.16	0.14	0.15	0.15	0.14	0.16	0.15	0.27				
CR	0.53	3.20	0.18	0.12	0.13	0.13	0.11	0.13	0.10	0.10	0.28			
MBEA	0.78	1.47	-0.09	-0.08	-0.13	-0.07	-0.04	-0.13	-0.18	-0.13	-0.05	0.61		
MBEP	0.68	1.11	-0.14	-0.09	-0.09	-0.09	-0.12	-0.12	-0.09	-0.10	-0.08	0.14	0.46	
LF	0.53	0.56	-0.12	-0.10	-0.10	-0.09	-0.11	-0.13	-0.07	-0.07	-0.08	0.09	0.16	0.28

SD - Standard Deviation
IIA - Idealized influence attributed
IIB - Idealized influence behavior
IM - Inspirational Motivation
IS - Intellectual Stimulation
IC - Individual Consideration
CR - Contingent Reward
MBEA - Management-by-Exception Active
MBEP - Management-by-Exception Passive
LF - Laissez-faire
TRANSFOR - Transformational leadership
TRANSACT - Transactional leadership
OUTCOMES - Faculty outcomes
S - Satisfaction
E - Effectiveness
EE - Extra Effort

APPENDIX G
SOURCE CODE FOR LISREL 8.30 CONFIRMATORY FACTOR ANALYSIS FOR LEADERS AND RATERS

SOURCE CODE FOR LISREL 8.30 CONFIRMATORY FACTOR ANALYSIS FOR LEADERS AND RATERS

```
*SY=LLAST.DSF
LA
EE E S IIA IIB IM IS IC CR MBEA MBEP LF
SE
1 2 3 4 5 6 7 8 9 10 11 12
MO NX=12 NK=3 LX=FU,FI TD=SY PH=SY,FR
LK
OUTCOMES TRANSFORMATIONAL TRANSACTIONAL
VA 1.0 LX(1,1) LX(4,2) LX(9,3)
FR LX(2,1) LX(3,1)
!FR LX(5,1) LX(6,1) LX(7,1) LX(8,1)
!FR LX(1,2) LX(2,2)
FR LX(5,2) LX(6,2) LX(7,2) LX(8,2)
!FR LX(9,2)
FR LX(10,3) LX(11,3) LX(12,3)
PD
OU AD=30 IT=250 ML SC TV MI EF ND=2 RS
```

*This line read as:
SY=RLAST.DSF
for the raters.

APPENDIX H
OTHER MEASUREMENT MODELS ANALYZED

OTHER MEASUREMENT MODELS ANALYZED

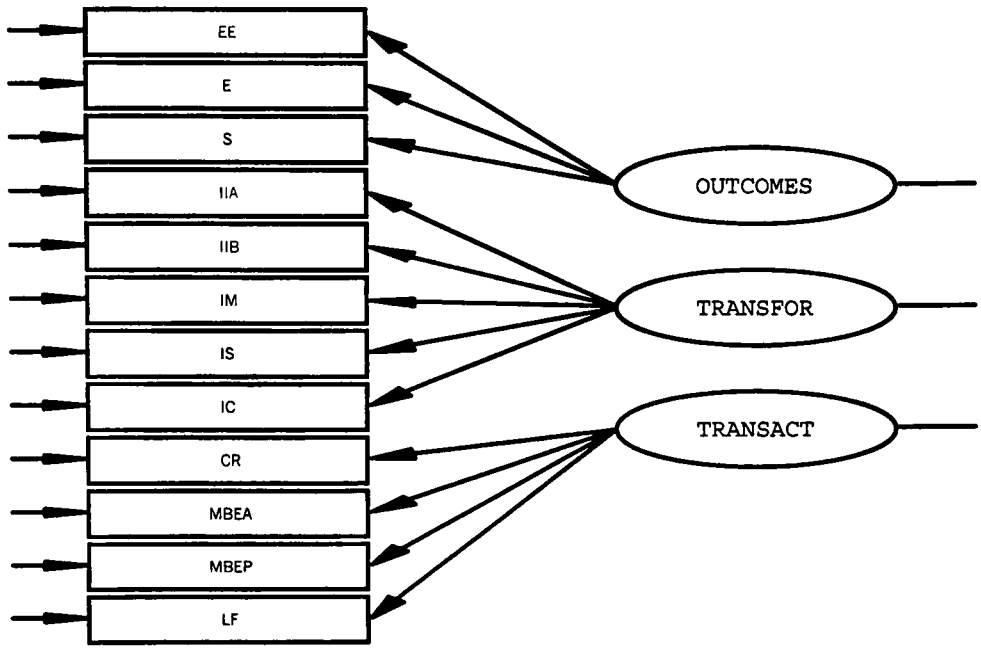

Figure H.1: Other Measurement Models Analyzed
Three-factor orthogonal measurement model

IIA - Idealized influence attributed
IIB - Idealized influence behavior
IM - Inspirational Motivation
IS - Intellectual Stimulation
IC - Individual Consideration
CR - Contingent Reward
EE - Extra Effort
S - Satisfaction

MBEA - Management-by-Exception Active
MBEP - Management-by-Exception Passive
LF - Laissez-faire
TRANSFOR - Transformational leadership
TRANSACT - Transactional leadership
OUTCOMES - Faculty outcomes
E - Effectiveness

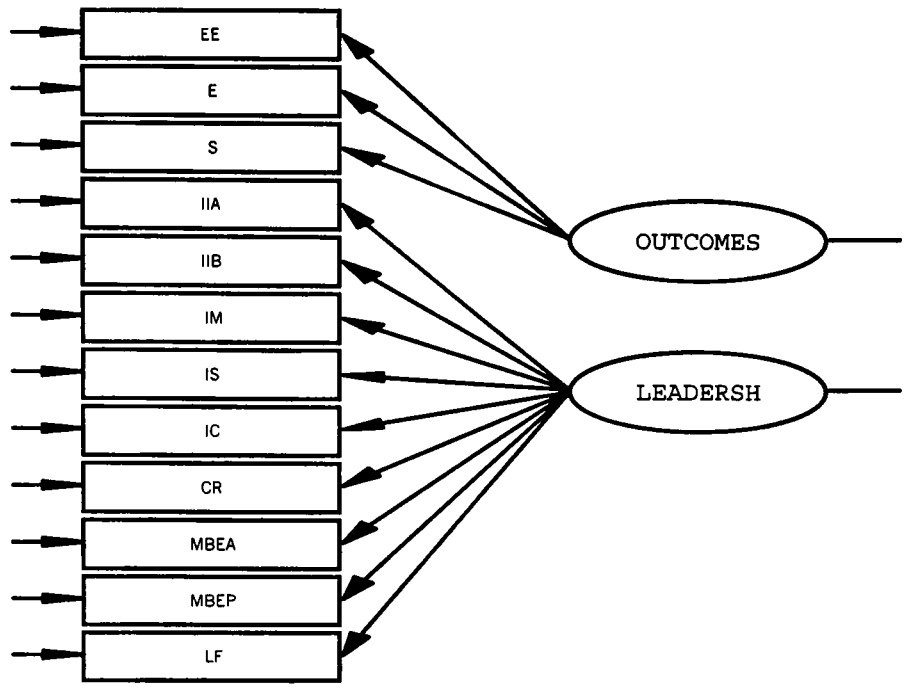

Figure H.2: Other Measurement Models Analyzed
Two-factor orthogonal measurement model

IIA - Idealized influence attributed
IIB - Idealized influence behavior
IM - Inspirational Motivation
IS - Intellectual Stimulation
IC - Individual Consideration
CR - Contingent Reward
EE - Extra Effort
MBEA - Management-by-Exception Active
MBEP - Management-by-Exception Passive
LF - Laissez-faire
LEADERSH - Leadership
OUTCOMES - Faculty outcomes
E - Effectiveness
S - Satisfaction

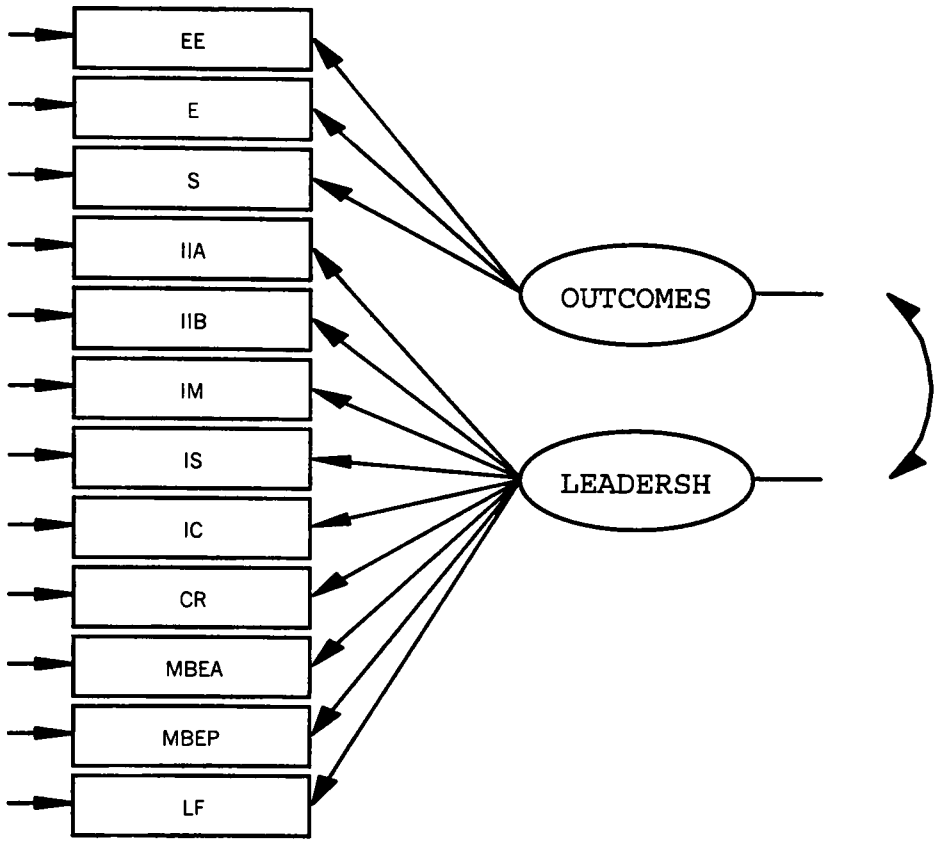

Figure H.3: Other Measurement Models Analyzed
Two-factor oblique measurement model

IIA - Idealized influence attributed
IIB - Idealized influence behavior
IM - Inspirational Motivation
IS - Intellectual Stimulation
IC - Individual Consideration
CR - Contingent Reward
S - Satisfaction
MBEA - Management-by-Exception Active
MBEP - Management-by-Exception Passive
LF - Laissez-faire
LEADERSH - Leadership
E - Effectiveness
EE - Extra Effort

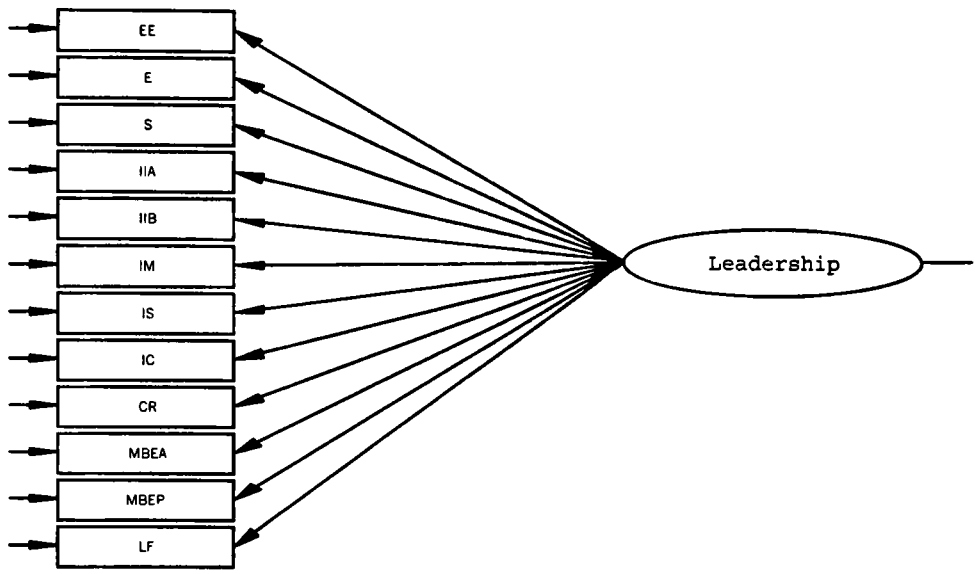

Figure H.4: Other Measurement Models Analyzed
One-factor measurement model

IIA - Idealized influence attributed
IIB - Idealized influence behavior
IM - Inspirational Motivation
IS - Intellectual Stimulation
IC - Individual Consideration
CR - Contingent Reward
MBEA - Management-by-Exception Active
MBEP - Management-by-Exception Passive
LF - Laissez-faire
E - Effectiveness
EE - Extra Effort
S - Satisfaction

APPENDIX I
QPLOT AND STEMPLOT FOR STANDARDIZED RESIDUALS

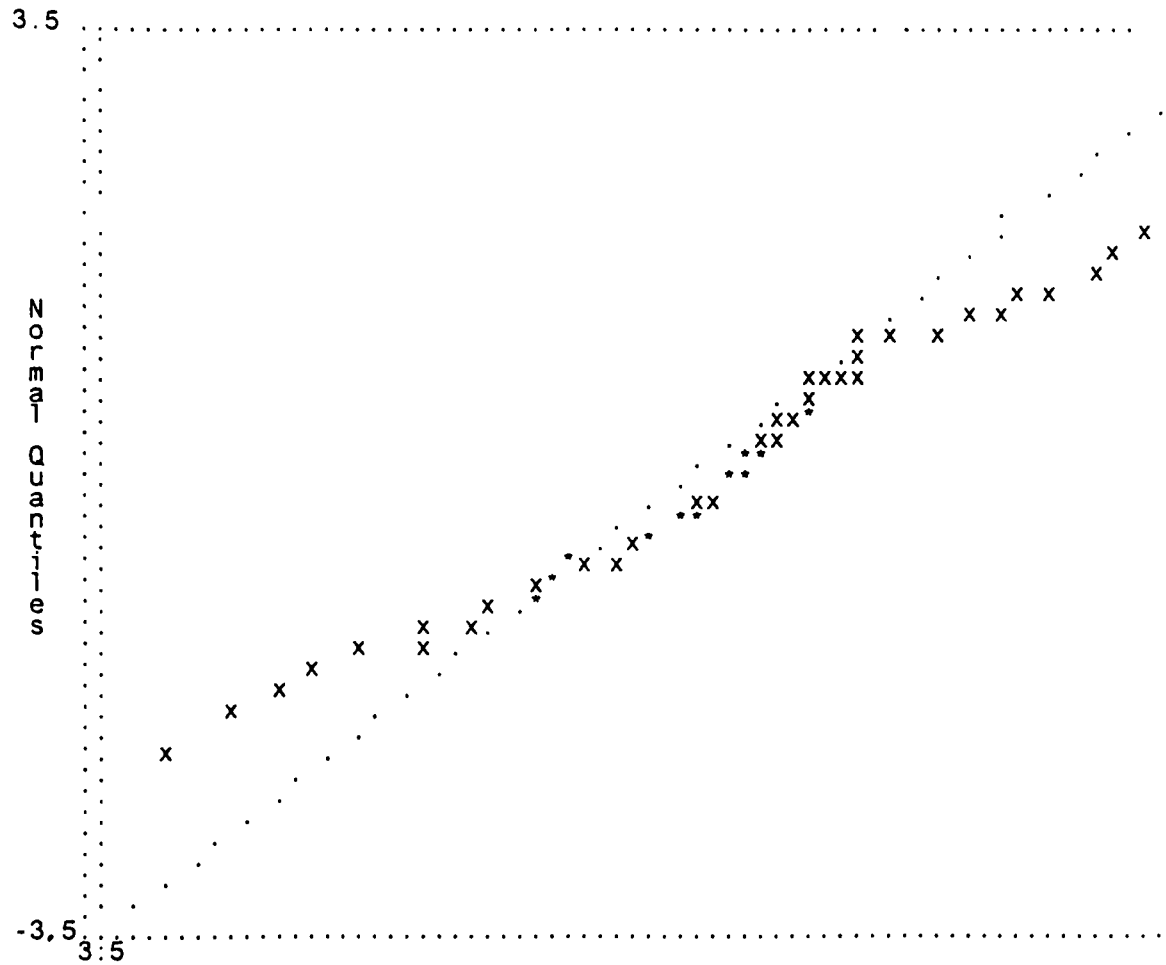

Figure I.1: Qplot of Standardized Residuals

```
- 3|1
- 2|8420
- 1|66320
- 0|998877643221000000000000000
  0|1122223333445555667778889
  1|000002579
  2|02458
  3|
  4|2
```

Figure I.2: Stemplot for Standardized Residuals

APPENDIX J
BIBLIOGRAPHY

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APPENDIX K
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