IMPLEMENTATION CHARACTERISTICS OF EFFECTIVE
CONTINUOUS QUALITY IMPROVEMENT TRAINING
AS PERCEIVED BY SELECTED INDIVIDUALS
AT TWO- AND FOUR-YEAR COLLEGES IN THE UNITED STATES

DISSERTATION

Presented to the Graduate Council of the
University of North Texas in Partial Fulfillment of the Requirements

For the Degree of

DOCTOR OF PHILOSOPHY

By

Katherine C. Miller, B.B.A., M.S. Ed.
Denton, Texas
December, 1996
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Within the last decade, continuous quality improvement (CQI) has been embraced by higher education management. An important component of the quality philosophy is to institute training for everyone: faculty, administrators, staff and students—in order to achieve a cultural transformation. The purpose of this study was to identify and describe the implementation characteristics of CQI training programs and to determine whether or not and to what degree relationships exist between these characteristics and training program effectiveness, as perceived by selected individuals at two- and four-year colleges in the United States.

A survey instrument was designed to elicit the perceptions of both the chief administrators and those quality professionals who are charged with the training process as they relate to specific implementation characteristics such as training content needed to convey the appropriate philosophy, program implementation processes, and the perceived effectiveness of the respondents' quality training program.

A 21-item questionnaire was used to gather the data from a sample of 524 individuals at two- and four-year colleges in the United States. The
dependent variables in the study related to items addressing program effectiveness based on four types of program evaluation, and the independent variables related to specific implementation characteristics.

Spearman correlation matrices were executed to test the relationships between and among implementation characteristics and between the four levels of evaluation. Multiple regression analyses were computed to determine which and to what extent implementation characteristics accounted for variation in each of the four measures of effectiveness. Analyses revealed that using a variety of philosophies, tools and content segments, providing training in quality awareness, team leadership, management and leadership, and assessment, using internal trainers, and the extent of staff and faculty support accounted for the largest proportions of variance. The statistical results for the two hypotheses which were derived from the research questions were also reported.
ACKNOWLEDGMENTS

Striving for quality has been a guiding principle throughout my life and even more so as I endeavored to achieve the doctoral degree. I offer my deepest appreciation to those who have encouraged, inspired, and contributed to the final fulfillment of this milestone in my life.

To my major professor, Dr. Howard W. Smith, Jr., I extend my deepest appreciation for his patience, advice, and professionalism. In addition, I thank the other committee members, Dr. William A. Miller, Dr. Victor Prybutok, and Dr. Roger Ditzenberger for their recommendations and insistence on a high level of scholarly research.

To my co-workers I extend my gratitude for their understanding, support and encouragement during the dissertation process. Special thanks are given to Tom Barker, Marsha Johnson, Mary Landers, Jim Messinger, and Martha Tandy and her able library staff for their generous contributions to this project. To Dr. Shirley Chenault, I extend my sincerest appreciation for her continuing encouragement, timely advice, and unwavering friendship.

I further express my love and thanks to both my father, the late Martin Bach, and my mother, Katherine, for their encouragement, assistance, and appreciation of the value of higher education. And most importantly, I acknowledge and express my love and grateful appreciation to my husband, Edd, for his sacrifices, understanding, support, and encouragement throughout the past eight years as I progressed through the doctoral studies.
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CHAPTER I

INTRODUCTION

Background of the Study

The emergence of the philosophy of continuous quality improvement or total quality management in higher education is at an embryonic stage. While many businesses and industries have embraced quality-first principles in order to maintain an edge in an increasingly competitive global economy and to react to fast market shifts, the public sector has been slow to adopt the practice. Educators at all levels, however, are increasingly concerned with accountability issues and have demonstrated an interest in pursuing the quality journey. The newest revolution in education is calling for a new kind of quality—quality that is identified by the processes used to achieve effectiveness in contrast to the traditional emphasis on discrete inputs and outcomes.

Higher education institutions across the country are working to implement the philosophy of continuous quality improvement in a tangible form by restructuring the way they deliver services to their customers: students, parents, business and industry, and the community. The philosophy of continuous quality improvement follows a simple common sense rule: "The first priority of an enterprise and everyone in it must be knowing and satisfying the customer" (Seymour, 1992, p. 13).
An important component of the quality philosophy is to initiate training for everyone (Juran, 1989; Deming, 1986; Ishikawa, 1986; and Crosby, 1976). In a higher education setting, this would include faculty, administrators, staff and students—in order to achieve a cultural transformation. The continuous quality improvement process requires various types of training for interpersonal and process skills as well as training in the use of statistical tools.

Training programs for total quality management in business and industry are usually sponsored through the human resource development (HRD) division or through quality centers or departments. These programs are often referred to as total quality training, quality improvement training, or quality control training and focus on company personnel learning new skills and using them on the job to achieve the goals of continuous quality improvement. The ultimate goal of the management system is to improve the quality of an organization's products or services.

In higher education, training for employees is not generally a normal function of the college, and many decisions must be made regarding the process for a quality training initiative. Therefore, the internal training coordinator for quality may be vexed by the following questions which Stieber (1991) identified in a similar study that focused on quality training initiatives in the corporate arena: Is there a specific training content required to convey the appropriate philosophy? Should a specific quality philosophy determine the creation of training materials? How should the program be implemented? Which employees and how many must be trained to effect organizational
change? Who should be responsible for the design and instruction in the training program? How long should the training program be? How should training sessions be conducted—at specified intervals or presented at one time? Should attendance at training sessions be mandatory or voluntary? And, what is the cost of continuous quality improvement training?

Stieber (1991) further sought to determine other variables which had an impact on effective training for quality, such as upper- and middle-management support of the overall effort. Many quality theorists have emphasized the critical importance of upper management support (Juran, 1989; Deming, 1986; and Crosby, 1976). Thus, Stieber also posed the questions: From which of the two groups is support most critical? And, what should the supportive role of such groups be during the training process?

Cornesky, McCool, Byrnes, and Weber (1991) agreed that one of five necessary conditions for implementing total quality management in academic institutions is the education and commitment of faculty and staff. They explained:

All of the quality leaders make the point that before lasting change toward quality can be realized, management must: (1) be trained in quality processes and systems, and (2) make it clear that they will support the commitment toward quality. (p. 95)

Although many training and development resources exist to assist business and industry with quality training initiatives, there are no precise answers to these questions. Just as corporate America has struggled with
training issues specific to the implementation of the quality philosophy, higher education institutions will also seek answers to the same questions as well as to questions which relate directly to the mission and goals of those institutions. As yet, information about training related to quality initiatives at higher education institutions is sparse.

In conjunction with the training mission, there is also the question of whether or not such training is effective. Effectiveness in training programs is characterized by how well outcomes are achieved as perceived by those who are responsible for the training function as well as by those who are looking for specific improvements in the organizational system. Crosby (1984) emphasized that training for quality:

... must be done in a formal way so people will know that it is going on. This means that classes must be structured and held. Courses must be documented in some way, and some records must be kept of those who qualify. Once training has been implemented, it is necessary to follow up and see whether the students are indeed practicing what they learned.

(p. 169)

Kirkpatrick (1975) identified four levels or techniques for evaluation that determine the effectiveness of training: Level 1: The trainee reactions; Level 2: The change in trainee learning; Level 3: Behavior change on the job; and Level 4: The results to the organization. These four techniques have been the basis for measuring the effectiveness of training programs in business and industry
over the past two decades. They have also been used as the measure for effectiveness in this study.

A comprehensive study of the identification of the implementation characteristics of effective continuous quality improvement training programs as perceived by selected individuals in higher education institutions in the United States would be beneficial to those administrators who must take a leadership role and make decisions regarding the management system that would best serve the college, its community, and those to whom it is accountable for institutional effectiveness. In addition, this information will be helpful to those higher education employees who are directly involved in the implementation and evaluation of the training function for continuous quality improvement and will provide administrators with the information they need to make appropriate and effective choices for the future implementation of training programs associated with quality initiatives.

Statement of the Problem

The problem of this study was to identify and describe the implementation characteristics of continuous quality improvement training programs and to determine whether or not and to what degree relationships exist between the implementation characteristics and training program effectiveness, as perceived by selected individuals at two- and four-year colleges in the United States.
Purposes of the Study

The specific purposes of this study in relation to the perceived effectiveness of training programs for the implementation of continuous quality improvement processes at selected higher education institutions were to:

1. identify through the literature and verify through experts the extent to which higher education institutions are involved in continuous quality improvement training programs;

2. describe how the institutions are organized for training personnel in the philosophy and tools of total quality management;

3. determine which methods of training are perceived to be effective in implementing the total quality management philosophy in higher education institutions;

4. describe the best practices for total quality management training at selected higher education institutions;

5. describe the impact of total quality management training programs within these institutions; and

6. provide information and direction for professionals charged with making decisions associated with the implementation of training programs for total quality initiatives in higher education institutions.

Research Questions

The following research questions were investigated to identify and describe the implementation characteristics of continuous quality improvement training programs and to facilitate an examination of the nature of relationships
between implementation characteristics and training program effectiveness for quality training initiatives, as perceived by selected individuals at designated higher education institutions in the United States:

1. What is the demographic profile of those higher education institutions involved in quality improvement training?

2. To what degree is participation in quality improvement training programs voluntary?

3. To what extent have various levels of personnel in the college received training in continuous quality improvement practices?

4. How is quality improvement training scheduled: as one continuous session, or at periodic intervals with employees returning back to the job between sessions?

5. To what extent have training participants taken part in any evaluation assessment of quality improvement training?

6. To what extent has quality improvement training been evaluated by various assessment methods?

7. To what degree have specific quality philosophies or tools supported the quality improvement training efforts?

8. To what extent have specific content segments been used as part of the quality improvement training process?

9. To what degree has the institution's top management supported the quality improvement training program?
10. To what extent is participation in quality improvement training and the use of the new skills on the job made a part of performance reviews?

11. To what extent do institutions utilize external consultants versus their own internal staff as trainers in the quality improvement training program, and is there a difference in the perceived effectiveness of the training provided by each?

12. To what extent are managers or supervisors involved in the instruction for the quality improvement training program?

13. To what extent are pilot projects used and appropriate groups trained for continuous quality improvement?

14. To what extent do two- and four-year colleges allocate funding for the quality improvement training process?

15. To what extent does the allocation of funding for training in continuous quality improvement at two- and four-year colleges influence the perceived effectiveness of training?

16. To what extent do relationships exist between the major implementation characteristics or training program variables associated with continuous quality improvement training programs?

17. To what extent are there relationships between implementation characteristics or training program variables and perceived quality training program effectiveness?
18. To what extent do selected individuals at two- and four-year colleges differ in their perceptions of the effectiveness of continuous quality improvement training programs at their institutions?

Hypotheses

In order to address certain research objectives, the following hypotheses were proposed:

Hypothesis 1 (Research Question 9): There will be no significant difference between administrators, faculty, and staff, at two- and four-year colleges, in their perceptions of the degree to which top management has supported continuous quality improvement training programs.

Hypothesis 2 (Research Question 18): There will be no significant difference between administrators, faculty, and staff, at two- and four-year colleges, in their perceptions of the effectiveness of continuous quality improvement training programs at their institutions.

Significance of the Study

This study investigated the implementation characteristics of training programs for total quality management or continuous quality improvement and the extent of the effectiveness of such training as perceived by selected individuals at designated higher education institutions in the United States. While total quality management has had a significant impact in management processes within the business sector, the management philosophy is just
recently being embraced by the public sector and more specifically by higher education management.

Quality-first principles are now considered to be a preferred management system that business and industry have adopted in order to maintain an edge in an increasingly competitive global economy. The proponents of the quality management philosophy maintain that the characteristics which distinguish exemplary companies from others are based in the knowledge that service and innovation are built on the principles of listening, trust, and respect for the creative potential of each employee (Juran, 1989; Deming, 1986; Peters and Waterman, 1982; and Crosby, 1976).

The Harvard Business Review (1991) published "An Open Letter: TQM on the Campus" which was written by the chairmen of six of the leading blue-chip companies in the United States. Their goal was to improve the awareness of TQM and initiate change within higher education:

We believe business and academia have a shared responsibility to learn, to teach, and to practice total quality management. If the United States expects to improve its global competitive performance, business and academic leaders must close ranks behind an agenda that stresses the importance and value of TQM. (p. 94)

The letter encouraged the forging of strategic links with higher education in the pursuit of quality within the academy where institutions are “missing the opportunity to lead change, and at worst, run the risk of becoming less relevant to the business world” (p. 94). In addition, the letter suggested that universities
and colleges learn what leading TQM organizations here and abroad are teaching their employees; establish research agendas in total quality management; and take inventory of their curricula, measuring the proportion of quality-related course content in core courses as well as in electives.

Adopting management concepts and practices from business is not new to higher education, but only recently (within the past ten years) have educators listened to the call for quality as it exists in the continuous quality improvement process. Today a growing number of colleges and universities are recognizing that quality concepts are more compatible with higher education than many existing management systems (Sherr and Lozier, 1991). Higher education institutions are struggling to survive in times of retrenchment, aging faculties, and increasing accountability to students, parents, and legislatures. The quality movement is being recognized as a viable method that can assist higher education in meeting the challenges of the 21st Century without hesitation.

Godfrey (1993) identified ten emerging trends related to the theory and implementation of total quality management in the public and private sectors over the next ten years. These trends included: (1) revolutionary rates of improvement; (2) expansion to all industries and all functions; (3) product design and process engineering; (4) intense education and training; (5) information systems and technology; (6) self-directed work teams; (7) partnering; (8) self-assessment and benchmarking; (9) customer focus; and (10) strategic quality management (p. 47). According to the author, each of these emerging trends offer an opportunity for further research. In terms of the
trend for intense education and training, Godfrey stated that the concepts, methods, and tools for modern quality management are new for most members of the organization, but little research has gone into defining just what is needed and when to ensure effective quality education and training.

Godfrey (1993) posed the following research questions relating to the quality training function: What is the basic core of knowledge and skills needed by all workers? What specific tools and methods are needed by specific groups or work units? How do adults learn? What should be the mix of learning and doing? And, what is the best way to deliver training? Why? (p. 57).

As higher education institutions adopt and adapt the quality philosophy and employ training programs to achieve implementation, there is a need for further data to analyze whether such training programs are effective. Further, it is important to determine the adaptation in such areas as costs, benefits, and the problems that have been encountered in the initiation of training programs. Clearly, information about the effectiveness of training programs for the implementation of continuous quality improvement in higher education is important to those institutions that are currently involved in the continuous quality improvement process, as well as to those institutions planning to adopt this management philosophy and implement future training programs.
Definition of Terms

The following terms were defined as they related to the study:

Baldrige assessment is an institutional evaluation based on the 7 categories, 28 items, and 63 areas of the Malcolm Baldrige National Quality Award Criteria.

Benchmarking is the process of reviewing, visiting and modeling the best in class programs, services, and practices.

Chief executive officer is a strategist and the designated authority for the total administration of policy matters and is the coordinator of aggregate daily operations of an institution. He serves as the custodian of the institution as appointed by the governing body of the institution.

Continuous quality improvement (CQI) is a fundamental attribute of total quality management, which arises from the philosophy that all business operations and work activities can be done more efficiently. It requires the development of a management approach that encourages identifying and seizing on-going opportunities to improve.

Culture is the pattern of shared beliefs and values that provide members of an organization rules of behavior or accepted norms for conducting business.

Customer is the end user of all programs and services produced within an institution. Customers are both internal and external.

Cycle time is the amount of time it takes to complete a specific work process.
Development refers to the organization's efforts (as well as the person's own efforts) to increase a person's abilities to advance in his organization or to perform additional job duties.

Effectiveness is the state of having produced a decided or desired effect; the state of achieving customer satisfaction.

Empowerment is the freedom of all employees of an organization to respond to customer demands and requests.

Expert is a professional whose intellectual well-being and personal traits are in harmony with established norms and standards of contemporary authority in that discipline.

Implementation characteristic is an element representative of a quality improvement training program such as the degree of management support for quality training efforts.

Major implementation characteristic is a vital element included in a quality improvement training program such as a philosophy, tool, or content segment.

Mission statement is a published document which defines an institution's reason for existing. The mission statement is shared with all of the stakeholders of the organization, both internal and external.

Organizational development refers to the improvement of the total organization in order to change the culture of the organization which will facilitate adaptation to a changing environment.
Stakeholders include employees, other organizations, communities, legislators, and any other individuals who may be affected by the operations of an institution.

Strategic plan is a detailed plan of action that an institution develops by establishing and defining measurable goals to achieve continuous quality improvement within an organization.

System is a set of well-defined and well-designed processes for meeting the institution’s quality and performance requirements.

Total Quality Management (TQM) is a management approach that seeks to improve quality and increase customer satisfaction through a continuous improvement process. All employees are held accountable for quality and are given tools and training to fulfill this responsibility.

Training refers to the organization’s efforts to improve a person’s ability to perform a job or organizational role.

Limitations and Delimitations

This study was limited to those higher education institutions identified in the literature as utilizing a total quality management or continuous improvement process as a management system in one or more areas of the institution. The population of the study was limited to the chief administrative officers, training managers, and total quality management professionals of these institutions. The specific implementation strategies used in this study were limited to characteristics exclusive of actual learning design. The study was subject to
limitations in the methodology of collecting data by mailed survey instruments and interviews.

Assumptions

The following assumptions were relevant to the study:

1. The survey respondents were involved in a total quality management or a continuous quality improvement process at their institutions when they completed the survey instruments.

2. The study was practical, and the analysis described the current extent of the effectiveness of training programs for the implementation of total quality management as perceived by selected individuals at postsecondary institutions in the United States.

Chapter Summary

In summary, this study was designed to determine the impact of training programs for the implementation of the total quality management processes, as perceived by selected individuals, at selected higher education institutions in the United States. The purpose of the study was to identify and describe the implementation characteristics of quality training programs and to determine whether and to what degree relationships exist between the implementation strategies and overall training effectiveness. In addition, the study included a summary of the costs attendant to training programs at two- and four-year colleges in the United States, as well as anecdotal descriptions of the problems that have been associated with continuous quality improvement training as described in the literature.
Administrators who are responsible for quality training programs in higher education must be aware not only of the characteristics of effective training but also of the relative importance of each characteristic. With such information available, they will then be prepared to appropriate their resources prudently to yield substantive and effective results from their training efforts.
CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The quest for quality in higher education is not new; but as recently as the 1980s, several major reform reports aroused new interest in quality processes and practices in higher education. Most notable of these was the National Institute of Education report, Involvement in Learning (Study Group on the Conditions of Excellence in American Higher Education, 1984). The reports were focused on issues of accountability, student learning and ability, program effectiveness, and institutional accomplishments of mission—all considered to be conspicuous failures of higher education.

Previously very little had been written or acknowledged about a systems approach to curing such ills in the higher education domain. Not until recently did higher education seek out a systems management approach or philosophy which is known as Total Quality Management (TQM) or as it is more commonly referred to in higher education circles, Continuous Quality Improvement (CQI). Mangan (1992) reported that "across the country, colleges and universities report success with the technique even though some skeptics say Total Quality Management is just the latest jargon for the kind of collaboration and shared governance that many colleges and universities have long practiced" (p. A25).
Within the last decade, a number of colleges and universities have decided to determine whether or not the industry-based principles of total quality management could help their institutions become better—more effective and more responsive to the challenges ahead. Fisher (1993) reported that such institutions as Oregon State, Wisconsin, Colorado State, Maryland, Minnesota, Clemson, Georgia Tech, and many community colleges, had already endorsed and adopted TQM in whole or in part. Jones and Timmerman (1994) observed "Quality-conscious, cost-conscious college leaders across the country have been studying with religious fervor the commandments of modern-day total quality management (TQM) proponents from business and industry" (p. 411).

Many higher education associations, organizations, and prestigious journals have devoted much time and energy in the quest to discover and understand the newest version of quality. In fact, Sloan (1994) described higher education today as being compelled to respond to a rising tide of consumerism, and TQM has been promoted as a way to address this issue, which in turn has generated immense discussion and controversy in the academy. Seymour (1994) indicated that "a mass of interested followers has emerged and TQM-related activities have surged" (p. 1).

It is in the same spirit that this research is undertaken—to discover and understand the continuous quality improvement efforts in higher education and, more specifically, the quality training mechanisms that must be in place to achieve the vision of continuous improvement.
The Concept of Quality

Quality has been defined as any continuous improvement of systems to provide better products or service (Cornesky, 1989). W. Edwards Deming (1986), a prominent quality theorist, believed that quality is whatever the customer needs and wants. Peters and Waterman (1982) characterized the philosophy of excellence as superior service to customers, constant innovation, and a commitment to people, quality, and leadership. They maintained that the characteristics that distinguish exemplary companies from others are based in the knowledge that service and innovation are built on the principles of listening, trust, and respect for the creative potential of each employee.

Philip Crosby (1990), a corporate vice president of IT&T, explained that "quality really is just doing what you said you were going to do" (p. 6). It is conformance to the requirements. According to Crosby, management has learned that they actually can do something about quality by defining the requirements—finding out what the customer wants, describing that, and then meeting that exactly. He asserted that quality is a function of expectations and that most errors are the result of lack of attention. He cautioned management to stop doing the things that work against the ultimate goal of defect-free products (Cook, 1991).

Seymour (1993b) emphasized that quality may be the most overused word in the English language today.

People are willing to pay for it, organizations are driven to invest in it, workers are exhorted to produce it, and advertisers feel compelled to
communicate it. Quality is a near universal goal. At the same time, it is one of the least understood concepts. Everyone wants it. But what is it? And once you decide what it is, how do you attain it? (p. 6)

The Japanese call it Kaizen (Imai, 1986). The West calls it quality control. Education calls it excellence. But they all lead to the same goal—a process for continuous improvement. A quality-first model is designed to permeate principles of excellence throughout the organization and provide a means to achieve Kaizen, which is the basic underpinning for the excellence in Japanese management. It is the key to Japanese competitive success. Kaizen means incremental improvement "...on-going, involving everyone, everybody's business. It is a process-oriented way of thinking versus the West's innovation and results-oriented thinking" (Imai, 1986, p. xxix). The customer is the ultimate judge of quality—both internally and externally.

Quality is the undergirding principle for continued success in many major corporations in the United States. Geber (1990) confirmed that "applying quality improvement principles to knowledge jobs is one of the most recent developments in the national quality push" (p. 30). Ford Motor Company echoes the refrain "Quality is Job 1" to its customers, to its competitors, its employees and its suppliers. Everything accomplished at Ford is deeply rooted in an allegiance to quality and excellence. Motorola Corporation has also been touted as a quality company that has been involved in the pursuit of excellence throughout its organization. Yates (1992) reported that total quality techniques
have cut manufacturing costs more than a billion dollars at Motorola within the last ten years.

Kaufman (1991) enhanced the quality definition through his quality plus model that depicts more than total quality as methods that extend the vision beyond a satisfied customer to one who is both satisfied and well served. He suggested that quality includes a societal-payoff dimension—moving beyond client satisfaction to include client and societal wellness. Quality plus responds to the need for a healthy, safe, and satisfied customer. This aligns with Drucker's concept that doing things right is not as important as doing the right things (Drucker, 1973).

Carothers (1992) believed that TQM is a philosophy that helps fulfill the basic need of all workers; that is, a clearer sense of purpose in our work. He espoused TQM as a natural fit for organizations like colleges and universities “that rely on the intellectual and creative abilities of their people” (p. 9).

The Philosophy of TQM

Total Quality Management (TQM) has been espoused by the big three gurus in quality consulting: W. Edwards Deming, Joseph M. Juran, and Philip B. Crosby—the best-known names in the quality initiative. Each has spent a good portion of his life telling companies that quality improvement is simple and that quality focuses on giving customers what they want—on building quality into products or services and continuously improving them. All three of these quality champions have focused on getting management's attention to create
organization-wide participation in planning and implementing a continuous improvement process that exceeds customer expectations. The total quality philosophy was built on the assumption that 85% of problems are a result of processes, not employees. TQM initiatives focus on doing things right the first time, every time.

As a management model, TQM emphasizes precise quality benchmarks, the importance of perfecting systems, and the decentralization of management control over these systems. The five guiding principles of TQM include: creation of an appropriate climate, focus placed on the customer, management by data/fact, people-based management, and continuous quality improvements (Juran, 1989; Deming, 1986; Ishikawa, 1986; Crosby, 1976).

TQM places responsibility for quality problems with management rather than on the workers. A principal concept of TQM is the management of process variation whereby variations in production or quality within a manufacturing or service process are viewed as special cause variations, which can be removed by employees operating the process; or common cause variations which require management action to change some inherent feature of the process (Kaufman, 1991).

C. Jackson Grayson, founder of the American Quality and Productivity Center in Houston, Texas, maintained that real TQM got started only a decade ago with the advent of the Baldrige National Quality Awards. Grayson described TQM as: "Total, meaning all people, all functions, customers and suppliers; Quality, meaning not just products, but processes, reliability, and quality of work
life; and Management, meaning senior management strategy, goal setting, organizational structure, compensation, and profits.” (Cook, 1991, p. 70).

The hallmark of TQM is the continuous improvement of organizations which is accomplished through a shift in focus from outcomes (or products) to the processes that produced them. TQM achieves its objectives through data collection and analysis. Flow charts, cause and effect diagrams, statistical process control techniques, and other total quality tools are used to understand and improve processes. While there are many versions and adaptations of quality across manufacturing concerns, and even more variants in service industries and health care, TQM is considered to have its roots tied to the basic axioms offered by W. Edwards Deming.

Deming’s 14 Points Related to Higher Education

Total Quality Management processes, which were developed by W. Edwards Deming, had its genesis in Walter Shewhart’s earlier research at Bell Laboratories. Shewhart focused on improving the reliability of telephones by building quality assurance into the entire system of design and manufacture, rather than relying on end-of-the-line inspection to remove defective phones before they entered the marketplace. Deming had been an advocate of Shewhart’s work in statistical process control; and finding little response at home for his ideas about quality, he took his show on the road to Japan. Deming’s quality crusade was considered to be largely responsible for the Japanese industry’s post-World War II recovery and dominance in world markets.
Most U. S. manufacturers ignored Deming's work until the early 1980s when severe competition was prevalent and ongoing improvement in cost, quality, and productivity had become critical to economic survival. Deming (1986) had the solution to this conundrum, which he espoused as a 14-point system and which is the core of his philosophy. Gitlow and Gitlow (1987) stated that although any one of the fourteen points could create improvement individually, it is the implementation of all the points that will ultimately transform an organization. Bonser (1992) noted that although not all of Deming's principles may be directly applicable to higher education, a strong case can be made that enough of them are relevant. A discussion of the fourteen points follows below.

Point 1 involves creating a **constancy of purpose** for the improvement of product and/or service (Deming, 1986). This means a never-ending commitment to the improvement of quality and an allocation of resources for the innovation and redesign of product and/or services. The organization's mission statement will focus on quality, continuous improvement, and customer satisfaction. Consumer research is utilized to meet the changing requirements of the consumer (Gitlow and Gitlow, 1987).

Seymour (1992) commented:

... Deming’s notion of **constancy of purpose** provides a consistent philosophy and a unifying focus by emphasizing a long-term commitment to a vision. It inspires confidence in everyone when the organization is able to articulate its goals and practice day-to-day decision making that is
consistent with those goals. Giving people the tools and techniques, the training, and the responsibility for causing quality creates a feeling that the organization is investing in its own people. (p. 33)

Adopting the new philosophy to ensure customer satisfaction as the primary goal of the organization is the essence of point 2 (Deming, 1986). Walton (1986) illuminated: "Americans are too tolerant of poor workmanship and sullen service. We need a new religion in which mistakes and negativism are unacceptable" (p. 34). Seymour (1992) observed that if improved quality is the goal, then the obvious answer to achieve it is to ask the people who work in the system to join with management to work on the system.

Point 3 cautions organizations to cease dependence on mass inspection to achieve quality (Deming, 1986). Basically this point challenges organizations to ensure that quality is built into the processes in the first place to eliminate the need for inspection on a mass basis which is usually at the end of the cycle or production (Gitlow and Gitlow, 1987). Since inspection after the fact neither improves nor guarantees quality, improvement of the process in order to prevent defects enables organizations to 'do it right the first time' (Scherkenbach, 1988). In academia this means ceasing dependence on testing to achieve quality. Learning experiences that create quality performance must be provided. Deming (1986) emphasized that grading should be abolished and that rating people may have harmful effects.

Point 4 recommends ending the practice of awarding business on the basis of price tag (Deming, 1986). Rather than using price alone, the emphasis
here is on evaluation of suppliers in such areas as management systems, financial condition, location, political position, personnel qualifications, design of product, manufacturing capability, purchasing power, inspection and testing, quality coordination, and price (Gitlow and Gitlow, 1987).

Point 5 advocates the constant improvement of the production and service system. This could be accomplished through the Plan, Do, Check, Act (PDCA) cycle that is to be continually repeated in the quality process (Gitlow and Gitlow, 1987, pp. 79-80).

Step 1: PLAN (P)—Collect data upon which a plan can be constructed for what needs to be accomplished in a given time frame. Next, determine what actions must be taken to realize the plan.

Step 2: DO (D)—Take the necessary actions that further the plan developed in Step 1.

Step 3: CHECK (C)—Check the results of the actions by collecting data to make sure that planning elements have been achieved.

Step 4: ACT (A)—Act by making the changes to the plan that are needed to better achieve customer satisfaction and to continue what was successful.

Point 6 instructs organizations to initiate training on the job (Deming, 1986). All employees must be oriented to the quality philosophy and to the organization's goals. Deming believed that most organizations are unable to truly implement total quality because of their pervasive attitude that people are an expense to be controlled rather than an asset to be developed. To achieve success in the quality mode in higher education means that all levels of
employees—administrators, faculty, and staff—must be trained in the philosophy and tools of quality. Thor (1994) explained that at Rio Salado College all regular full-time employees completed a 40-hour basic TQM training program. In addition, the average employee at that college has participated in over eighty hours of training and sessions on such topics as giving and receiving feedback, the stages of change, and driving out fear. All full-time employees at Rio Salado have served on a continuous improvement team or have been involved in the quality initiative.

Instituting leadership is the core of point 7. The chief responsibility of management must be the development of people so that they continually improve. Many of the management practices and principles that are required in a TQM environment may be contrary to long standing practices in higher education. Only a strong leadership team focused on quality improvement can overcome the inevitable inertia and resistance to change by creating clear quality goals and developing systems and methods for achieving these goals. Senge stated that "...in the learning organization, leaders are designers, stewards, and teachers who are responsible for building organizations where people continually expand their capabilities to understand complexity, clarify vision, and improve shared mental models... and are responsible for learning" (1990, p. 340).

Point 8 advises organizations to "drive out fear" (Deming,1986). There must be an atmosphere of mutual respect where individuals are not afraid to express ideas or ask questions, so that everyone can work effectively for the
organization. Empowerment was suggested as one strategy for achieving enhanced effectiveness by allowing an individual or work unit to determine how an outcome would be achieved (Peterson, 1993). Empowerment is usually implemented from the top down and gives each person delegated authority with concomitant responsibility founded upon accountability.

Breaking down the barriers between staff areas is the message of point 9 (Deming, 1986). Walton (1986) noted that departments or work units are often competing with each other or may even have goals that conflict. Emphasizing common goals that everyone in the organization can aspire to will facilitate open communication within the organization (Scherkenbach, 1988). Strategies must be developed to increase cooperation among groups and individuals in the higher education arena to include faculty, staff, and administrators. Those involved in teaching, research (faculty and institutional), student services, food service, accounting, academic affairs, etc. must work as teams, both work teams and cross-functional teams. Seymour (1992) reported that higher education has notably few successful adaptations of teamwork concepts.

Point 10 suggests replacing numerical goals and slogans with the continuous improvement process. Deming (1986) believed that slogans, posters and other methods that urged productivity of the workers were not effective and should be replaced with charts, graphs, and management reports which depict progress toward achieving improvement. Lewis and Smith (1993) maintained that in higher education the bulk of the causes of low quality and low productivity belong to the system and are, therefore, beyond the control of
the faculty, administration, staff, and students. Exhortations, then, will create adversarial relationships among and between these constituencies.

The elimination of quotas and management by numbers is the basis of point 11. Deming (1986) contended that a quota is an impediment to the improvement of quality and productivity because a specified goal may be beyond the capability of the system and will not be reached. In addition, a person may meet a quota at any cost, without regard to damage to the organization, in order to keep a job (Walton, 1986). Within the academy, performance standards for faculty, administration, staff and students, such as increasing retention by X%, should be eliminated. Leadership should be substituted for management by numbers and numerical goals.

Point 12 recommends that organizations remove barriers to pride of workmanship. In the higher education setting, this point would translate to the elimination of obstacles that rob faculty, administration, staff and students of the right to take pride in and enjoy the satisfaction of personal performance and productivity. According to Deming (1986) the typical appraisal system is an inhibitor to continuing improvement in any organization. Within two- and four-year colleges, this would mean abolishing annual merit ratings and the use of management by objectives. The focus is shifted from quantity to quality.

Point 13 involves the retraining and education of everyone in the organization. According to Gitlow and Gitlow (1987), this includes statistical training, basic mathematics, reading, and communication skills, as well as training employees to define the organization's mission and goals. The
academy must adopt and adapt these same training functions in order to effectively implement continuous quality improvement processes which will ensure the ultimate goal of institutional effectiveness.

The maintenance of a system which assures a never-ending quest for continuous improvement is the essence of point 14. Deming (1986) emphasized that management systems must be created which foster the implementation of points 1-13. Everyone in the organization must work to accomplish the transformation. Thus, in the academy, quality is everyone's job—everyone acknowledges the focus of the quality philosophy and accepts its potential to help the organization move in a common direction (Lewis and Smith, 1994). Senge (1990) described the essence of individual responsibility as personal mastery in The Fifth Discipline:

Personal mastery is the phrase my colleagues and I use for the discipline of personal growth and learning. People with high levels of personal mastery are continually expanding their ability to create the results in life they truly seek. From their quest for continual learning comes the spirit of the learning organization. (p. 141)

In summary, the heart of Deming's philosophy is an insistence that management take the time and resources to create a positive and productive climate in which employees are continually kept informed about the most effective methods and practices to achieve continuous improvement. This climate will enable employees to help one another to adapt, replicate, and
refine practices—essentially an ongoing process that continually improves
upon what is already working.

The Malcolm Baldrige National Quality Award

The Malcolm Baldrige National Quality Award, named for the late
commerce secretary, was established by Congress in 1987 to promote national
awareness of the importance of continuous quality improvements in U. S.
companies. It is considered to be America's highest honor for quality and is a
public/private partnership administered by the National Institute of Standards
and Technology. The award is a comprehensive and systematic method which
enables performance improvement in an organization.

Each year up to six Baldrige awards are granted with a maximum of two
awards in each of three categories—manufacturing, service, and small
business (Whittemore, 1990). The application process for this award is
considered to be quite lengthy and the attendant costs can also be significant. A
panel reviews each application and prepares feedback for each participant to
help them further improve the quality of their operations. The criteria for the
award is divided into seven categories, each with two or more examination
items. They include: leadership, information and analysis, strategic quality
planning, human resource utilization, quality assurance of products and
services, quality results, and customer satisfaction. These criteria have become
the standard by which organizations assess quality through benchmarking in an
ongoing effort to improve both processes and products.
Since the inception of the Baldrige award, a parallel award was created for the educational entities in 1992 (Fisher, 1995). The Baldrige Education Criteria remained the same as the Business Criteria but with modifications in structure and content which were designed to accommodate the mission of educational institutions. Thus, maintaining student success and institutional effectiveness is the central focus of the Baldrige Criteria for Education. The Criteria focus not only on the outcomes or results of educational institutions, but also on the conditions and processes that lead to those results. Fisher stated that "the Malcolm Baldrige National Quality Award Education Criteria are directed toward delivering improved value to students and stakeholders while simultaneously maximizing the overall effectiveness of the institution" (p. xiii).

As part of his role as senior examiner for the Malcolm Baldrige Quality Award, Seymour (1996) explained why the Baldrige is needed in education and what the first pilot year produced. According to Seymour, for higher education, the Baldrige may be one of the best chances for the continuance of self-control of college and university campuses. He cited the managed care aspects of health care, which is considered to be a professional bureaucracy, as an example of what might happen in academe. Seymour contended that the Baldrige award is an alternative paradigm to business as usual in the academy; and it deserves the attention of academe because "it provides a methodology such that our professionals can correct deficiencies heretofore ignored; it is both a systematic and systemic way to regain control over our own institutions" (p. 11).
The education pilot criteria were built upon a set of core values and concepts which constitute a comprehensive way to codify performance improvement principles. During the first pilot year (1995) of the Malcolm Baldrige National Quality Award for education, there were nineteen applications—ten from higher education and nine from K-12. Out of a possible 1,000 points, the lowest score was 150 and the highest 450. There were no awards in the 1995 pilot; however several site visits were conducted for those institutions that showed signs of being a potential award winner. After a thorough analysis of the results, Seymour (1996) summarized that the applicant higher education institutions were immature in their development and that:

Leadership is where you must begin, and so it followed that leaders’ first efforts would be in planning and training. It also followed that the applicants would be able to describe their approaches in these areas. The initial weakness occurred with Information and Analysis; then, lacking well-designed self-assessment strategies, for example, meaningful results were rarely available. Further, innovative approaches were often described, but few instances existed in which such approaches were deployed across the institution. (p. 14)

Despite the mediocre performance in the pilot project, Seymour underscored the value of the Baldrige award as a means to foster innovation by providing a yardstick that will yield insights and ideas for improving organizational practices.
TQM Applied to Service Sectors

Service industries, as well as public institutions, have been the last to embrace the Deming quality-first system. Butterfield (1991) asserted that the real reason service industry leaders have declined to adopt these points may be that most service managers are too busy fighting fires and do not have time to reflect. They simply do not think about how to translate Deming's concepts into the language of service or to incorporate his principles into their corporate culture. He recommended a revised 14-point list that speaks to the needs of service industries and challenges leaders to develop a way to transfer this knowledge to management and employees at all levels as quickly as possible.

In his article, "Improving the Quality of Education: W. Edwards Deming and Effective Schools," Stampen (1987) affirmed that Deming's overall approach to improving the quality of products and services in industry seemed adaptable to the management of education. He suggested that the 14 points were similar to those guidelines emerging from the literature about effective schools and school improvement and that:

"... the Deming approach emphasizes something that has been understood for quite some time but ignored by many educational researchers and practitioners: namely, that the test of anyone's ideas for improving the quality of educational services is whether they can be shown to be effective." (p. 428)
Carothers (1992) reported that TQM is not restricted to manufacturing entities or even to business. It has spread rapidly through all fields of enterprise, to the service sector, to government, to health care, and now to education.

The literature provides a substantive collection of information which corroborates the recent implementation of TQM principles in higher education as a means to improving institutional effectiveness. The application of this management philosophy has become a new challenge to higher education.

Total Quality Management in Education

Adopting management concepts and practices which originated in business and industry is not new to higher education. Examples have included the establishment of a formal chain of command, reports, inspections, performance evaluations, competitive bidding, and strategic planning. An alternative to many of these business practices may be total quality management. Today colleges and universities are recognizing that TQM concepts are more compatible with higher education than many existing management systems (Sherr and Lozier, 1991).

The philosophy of Total Quality Management, however, has not been easy to integrate into higher education systems. Sherr and Lozier (1991) explained that the phrase total quality is a derivative of total quality control, originally used by Feigenbaum in 1983. Higher education wants to provide high-quality services, but there are varying methods to define and measure quality. Furthermore, the words control and management imply centralization
and authoritarianism, so they typically insult the community of scholars. TQM relates to statistical control—not to managerial decisions—and the need to develop stable, predictable processes. It is not intended to imply control of people or processes. Coate (1991) illuminated “... Faculty members see themselves as emphasizing diversity. To them, the idea of quality control suggests uniformity—an attempt to bring everything to the same level” (p. 28).

Sloan (1994) posited that the great challenge in adopting TQM on campus is finding a language that effectively communicates the benefits of TQM to the faculty, which will ultimately calm their apprehensions. As president of the University of Rhode Island, Carothers (1992) addressed the issue of language:

Our challenge is not to fit colleges and universities into some customer paradigm or language model derived from IBM or Xerox or PPG or Kodak, but rather to answer the questions in our own way so as to gain the self-knowledge that will help us to improve. Our challenge is to change our habits, to adopt new ways of behaving so that we indeed better serve those whose needs we now better understand. In struggling with these challenges, the necessary language will emerge, and that language will be ours, authentic and not derivative. (p. 8-9)

Marchese (1993) suggested that the pessimism about TQM in higher education comes from a comparison with its adoption in industry. He explained: “Motorola and Xerox remade themselves into high performing work organizations because they had to—it was change now or die” (p. 13).
Marchese concluded that perhaps few institutions or people in higher education feel that there is enough pressure to justify such a transformation.

Bender (1991) maintained that "if you can count it, you can improve it" (p. 24). As superintendent of the Crawford Central School District in Meadville, Pennsylvania, he embraced the principles of TQM. Rather than instituting TQM throughout the system, Bender focused on specific project selection where certain problem areas could be addressed, quantified, and improved. Bender believed that the application of quality-first processes would be used increasingly to solve problems in the service sector and that superintendents and other top managers would also be able to improve the quality of educational programs and services through visible and sustained commitment to TQM.

Schargel (1991) declared that public education has been totally ignored in the quality process. Where American public education was once regarded as the best system, it is now considered second rate—scholastic aptitude test scores are dropping; remediation classes are the norm in high schools and colleges; many high school graduates cannot read, compute, write or think critically; and the nation's high school dropout rate is staggering at 30% for all students. (Averages for blacks and Hispanics are higher.) Schargel recommended that schools establish the same quality standards and techniques used by business and industry in order to regain the quality once associated with the public education system. Heverly (1991) noted that TQM is a technique traditionally reserved for the manufacturing sector but has recently
spread to service companies, government agencies, and educational institutions.

CQI in Higher Education

A review of the literature has confirmed that the academy is actively involved in the discovery and implementation of continuous quality improvement processes, both in two- and four-year colleges and universities. In addition, information exists as to what has worked and what has not in terms of integrating quality principles in higher education across the United States. Horine and Hailey (1995) discussed the key challenges to successful quality management implementation in higher education which included organizational culture, senior leadership commitment, faculty support, implementation time, and training.

DeCosmo, Parker, and Heverly, (1991, p. 13) described the implementation of TQM at Delaware County Community College (DCCC) as "the new problem-solving paradigm in the search for quality . . . because it best addresses some of the challenges we will face in the last decade of the twentieth century." In the past, solving problems or making improvements at colleges and universities equated to spending money. Higher education institutions have added staff, constructed buildings, purchased equipment, enrolled more students, and temporarily many problems were lost in the paperwork. Today, resources are drying up, and costs and conservation of resources are major issues in the nineties and into the next century. At DCCC the principles and methods embodied in TQM are considered to be an avenue
to program and service excellence. These authors maintained that "competition increases as the number of traditional students decline, and prospective students enjoy a buyer's market" (p. 14).

Seymour (1992) reported that colleges and universities throughout the country are struggling to survive. He noted that we are currently in the age of consumerism, and college students are searching for quality and the total student services package. Students and parents are more educated and determined to get answers rather than be satisfied by the well-maintained grounds and the football team. The quality movement in higher education is fueled by competition, cost containment, accountability, and one-stop shopping.

According to Seymour (1992), colleges and universities tend to define quality in their own jargon: the number of terminally qualified professors on the faculty, the size of the library holdings, and securing and maintaining good standing with accrediting associations. It has become apparent that the primary customers of the institution do not want more library books and a set of faculty degrees listed in the back of a catalog. The notion of customer satisfaction on the collegiate campus has become heightened, and many students express their frustrations with the traditional bureaucratic systems. As one University of Texas at Austin undergraduate said, "Here, it's not what the system can do for you, but what you can do to make the system work for you. You have to fight it" (Wilson, p. A37).

Higher education has many internal and external customers and, therefore, can no longer have the luxury of utilizing myopic definitions of quality.
The user is not limited to a student or a parent. The difficulty is that many higher education institutions insist on the traditional definitions of quality and accreditation standards. Therefore, the focus is limited and rigid. In contrast, Seymour (1992) insisted that TQM is not concerned with debating definitions or turf disputes but with developing and understanding constant improvement. At the core of TQM is the question, "How can it be done better?" not "How well is it doing?" Higher education is competitive, and quality is the discriminating feature of the survivors.

Ellen Chaffee (1990) expressed her concern that educators "very often do not do the right thing" (p. 101). She listed a plan of action that parallels some of the elements of Deming's 14-point plan. Chaffee suggested that every person in the organization must work primarily to discover and observe the real needs of others. Administrators who are motivated by a service ethic see their role as identifying and fixing inadequate processes inside the organization and matching its services to the needs of students and the external society.

"Strategic quality management is not about organizational survival; it is about satisfying and delighting constituencies" (p. 113). Another important aspect of the plan of action is for the individual to be treated with dignity and respect at all times. Chaffee indicated that the final step is for management and administration to shed the need to control people in favor of a need to liberate people. This action is rewarded by empowering individuals to take corrective actions without unnecessary involvement from supervisors.
Edwards (1991) provided a concise presentation of the benefits of TQM in terms of three components of the total quality system: teamwork, statistical process control, and a documented measurement/management system. He concluded that TQM can help higher education to: (a) focus on the proper needs of the market, (b) achieve top-quality performance in all areas, (c) produce systems for achieving quality performance, (d) develop measures of achievement, (e) help institutions to become competitive, (f) develop team approaches, (g) improve communication, (h) reward outstanding achievement, and (i) facilitate a continual review process.

According to Seymour (1992), we are foolish to think of quality as inputs, such as the number of Ph.D.s held by the faculty or the status of accreditation standing. Seymour stated:

Quality runs deeper than that, much deeper. Quality must be embedded in the institution's heroes, it must be manifested in the way that buildings are maintained, it must be evident in how people treat each other, and it must be at the very essence of what the organization and its members hold most dear. (p. 148)

Seymour (1992) has dubbed the college environment as a new culture of quality with everyone at the college a service fanatic. However, he softens the rigor of TQM's use of statistical controls and appropriates large chunks of academic marketing, strategic planning, and better communication in his plan of TQM for higher education. A survey of 22 colleges and universities that were among the TQM pioneers was conducted by Seymour in 1991. The survey
found that while many of the benefits of TQM were difficult to quantify, institutions often reported that employees felt better about their jobs, students were happier, and the process had helped to break down the barriers between faculty, staff, and management.

**Barriers to the Implementation of TQM in the Academy**

On the cynical side, there are those detractors of TQM who argue that the management process cannot fit in today's higher education world. Fisher (1993) maintained that "TQM may help in administrative service areas . . . but it offers nothing that smacks of amputation, risk taking, or dramatic change" (p. 17). He acknowledged that TQM in higher education may assist in helping do what we do better, but what we really need is something different such as inspired leadership, a long-range plan, individual accountability, and cost reduction to effect changes that will truly cure the ills of the academy.

McCormack (1992) theorized that TQM efforts often do not meet expectations "because people fail to distinguish between philosophy and strategy. A disappointing outcome is usually due to weak tactics and the lack of a strategic framework." (p. 43). He suggested that to continually improve the quality of products and services, a strategic or operational framework must be established that will provide focus, guidance, and consistency.

Winter (1991) suggested several barriers to the acceptance and application of TQM into higher education institutions. One major barrier is the organization's view of itself as currently using participatory decision making. Winter cited a survey conducted by the National Center for Research to Improve
Postsecondary Teaching and Learning, which indicated that the majority of administrators believed that faculties have a large influence in deciding institutional academic policies and departmental matters. Thus, there is the underlying assumption that this decentralization supports and promotes the participatory process. Therefore, institutions are reluctant to invest any more time and effort into learning and implementing a system that they believe is already in use.

Ewell (1993) agreed with this perspective, characterizing the notion as the academy's recognition that most of these things appear to be already in place. However, he cautioned that even though many core ideas of quality do have compelling academic counterparts, there are many things that are not so simply translated to the quality vernacular.

Another barrier identified by Winter (1991), which is unique to an educational institution, pertains to the top leadership. The emerging role of a college or university president as an external ambassador concerned with activities such as legislative issues, community involvement, and outside funding, may necessitate delegation of internal leadership to other administrators. In terms of the implementation of TQM, this may limit the effectiveness of the new initiative.

According to Winter (1991), the lack of a shared vision, which is embraced and supported by the entire institution, poses yet another barrier to implementing TQM in a higher education organization. Faculty members have become more isolated from the global institution and their loyalties tend to be
more focused on their disciplines and departments rather than on the institution as a whole. In addition, the loyalty of administrative staff members is limited by their perception of lack of support from the top management. This type of organizational culture will not easily accept programs such as TQM.

Bonstingl (1992) identified some of the potential pitfalls and obstacles in the adoption or adaption of TQM in education as: (1) Total Quality is not just another project to do while you wait for the next hot item to come along. Therefore, commitment to a major transformation and way of thinking is required; (2) Top leadership is essential for effective quality processes. They must demonstrate openly their ongoing personal commitment to TQM to inspire the faculty and staff; (3) Training is essential if the meaning of TQM is to become embedded in the culture of the campus. Resources must be invested to provide adequate training that conforms to the language of academia; and (4) There is no magic plan to institute quality perspectives—it comes with continuous learning.

Hansen (1993) reflected on why adoption of TQM has lagged in higher education. He suggested that there are few adherents because many institutions may regard TQM as just another fad—much like the long discarded MBO (management by objectives) approach of the 1970s. Hansen also posited that a slower acceptance or infusion into the instructional areas of the institution are due to differences in organizational structure. According to this author, colleges and universities "... are composed of faculty members, sometimes working in groups, but more likely alone, who create new knowledge,
synthesize existing knowledge, and transmit new and existing knowledge directly to students, and less directly to the general public” (p. 261). Difficulties with the concept of continuous quality improvement may, therefore, arise because the majority of faculty members do not see their work as contributing to output or to the satisfaction of the institution’s customers.

Coate (1993) concurred that the most common barrier to the successful implementation of TQM is the conviction that it is just another fad—or the latest thing in management philosophies. He emphasized that TQM is much more than a fad; it is an evolution of many systems based in the behavioral sciences, and it is right for today’s workplace. Additional barriers identified by Coate included: (1) The barrier of time, meaning the time that TQM takes is significant especially in terms of holding team meetings; (2) The barrier of language, which is derived from an industrial model. Often faculty members are suspicious of such terms as quality control, process performance measures, and customers; (3) The barrier of middle management, where mid-level managers did not have the expertise to facilitate a teamwork approach or perhaps they were unwilling to do so; (4) The barrier of university governance, where there is no hierarchical structure on the academic side, yet a well-entrenched system of politically correct committees and task forces may exist; (5) The barrier of dysfunctional work units, where internal existing problems will not be remedied by TQM processes; and (6) The barrier of attitude, where expectations may exceed possibilities, where suspicion transcends acceptance of an industry-based model, and where a basic resistance to change is the norm.
Several education reports have also documented problematic implementation efforts in colleges and universities. Entin (1993) completed a study of ten higher education institutions in Boston who had reported interest in the implementation of TQM. The primary findings from Entin's work were:

1. There were no specific TQM philosophies or techniques utilized at any of the colleges visited. The TQM advocates seemed to be flexible and pragmatic in approaching implementation.

2. At the six institutions where the president was predisposed toward TQM, introduction of the subject of TQM was followed by a training session for the senior management. The training was conducted by an outside consultant or professional trainer and lasted one or two days. Entin (1993) noted that the training led to further serious discussions about TQM which sometimes fostered opposition by some campus leaders.

3. On several campuses, senior non-academic administrators affirmed the value of TQM and proceeded to implement the concepts within their work units. In eight of the institutions Entin visited, one or more administrative units were involved in implementing some form of TQM.

4. Even though seven of the ten institutions had begun to study and employ TQM two year's prior to Entin's visit, all of the advocates perceived their institutions as just beginning. Those involved in the process considered implementation to require between five and ten years to impact the culture of the organization and its ways of doing business.
Entin (1993) concluded that the success of TQM is related to the level of commitment by the college president and senior administrators. In addition, Entin suggested that two conditions are necessary if TQM is to move beyond the fad stage: (1) college presidents must recognize TQM as a means to resolve major problems facing their institutions; and (2) senior academic affairs administrators and faculty must believe that TQM is related to their concerns and interests (p. 31).

In a follow-up report one year later, Entin (1994) found that five of the ten Boston institutions he studied either abandoned or delayed their TQM implementation efforts after a year or two of involvement because of unprecedented crises such as major budget deficits and prospective employee layoffs. One of the institutions that declared that formal implementation of TQM had stopped, reported that TQM had been replaced as a priority by multiculturalism. At four of the remaining institutions, TQM occurred in selective work units in which there was a champion for continuous quality improvement. At the tenth institution, Babson College, TQM was reported to have strong support from the top management and was being integrated into many other areas of the college. Entin (1994) reported that Babson has thoroughly embraced the quality philosophy and is now “managing by fact instead of by intuition and anecdote” (p. 4).

Entin (1994) concluded that inadequate training in quality management principles and tools on campuses was a key reason for the failure of the TQM efforts in higher education. He maintained that campuses do not understand the
nature of the disciplined approach of TQM and that it requires special tools and ways of doing business that must be studied and practiced. Another reason offered for the apparent failure of TQM at these institutions is the culture of academic institutions which are resistant to change. Entin also stated that initial interest in TQM may be prompted by administrators looking for a way to ease fiscal problems which does not generate broad institutional interest.

Seymour and Collette (1991), in a study of 25 colleges and universities activating TQM processes, also reported implementation problems such as: lack of time, a tendency toward lip service, aversion to change, inability to get below the surface, the recognition of real teamwork versus turfmanship, and a lack of tangible results.

Notwithstanding the apparent perceived impediments, the implementation of continuous quality improvement processes is still attractive to many higher education institutions. Institutions that survive the increasing competition will be those that best meet the demands of their students, employers and communities. Adopting a total quality management or continuous quality improvement process may give institutions the competitive edge and credibility needed to attract investments for further development. It would appear that those institutions that capture the quality niche in the nineties will meet the challenges of the 21st Century without hesitation.

Case Studies about TQM in Higher Education

The literature described many examples of the implementation of total quality principles or continuous quality improvement at higher education
institutions across the country. The case studies included below identify the successes and disappointments with the implementation of quality practices at several two- and four year colleges.

Fox Valley Technical College. In 1985, a Quality First process was implemented at Fox Valley Technical College in Appleton, Wisconsin. Under the leadership of its president, Dr. Stanley Spanbauer, a quality model commonly used in manufacturing was adapted to provide a system to improve productivity, reduce costs, and ultimately lead to educational excellence. Spanbauer (1987) noted that one of the key elements of this program was the development of human educational resources to their highest potential. At Fox Valley, the general theme was that “Quality First is a perpetual activity” (p. 180).

Fox Valley was the forerunner in the implementation of TQM in higher education in what Spanbauer called a cultural revolution. He maintained that TQM means moving away from the idea of managers and toward the idea of leaders. "It also means changing the way we think about what we do, why we do it, and who are our customers" (Hendley, 1992, p. 6). At Fox Valley Technical College, many improvements and successes have been attributed to the TQM philosophy: the drop-out rate decreased while the number of businesses working with the college continued to climb; an employee union contract was settled through a win-win negotiation process; and employee grievances were drastically reduced.

As a part of the emphasis on customer satisfaction, this college offered a variety of guarantees to its customers. Businesses and industries that used the
college for training programs were guaranteed refunds if they were not satisfied with the results. Graduates were guaranteed placement or free retraining if they could not find a job. And, as part of its total commitment to customer service, the college also provides proficiency statements along with its certificates and diplomas.

Spanbauer (1987) conceded that certain problems arose while the college was in the process of adopting quality-first principles. These included lack of commitment from those involved, aversion to change, poor planning, and early expectations. But even with these challenges, Spanbauer believed that educators have to realize that

... quality is not only the right thing to do, it is necessary for the survival of the American educational system. Even educational systems need to remain competitive. If we don't do it, the Japanese will be here to do it for us. (Hendley, 1992, p. 7).

Oregon State University (OSU). Oregon State University began its conversion process to TQM in 1989. Coate (1991) described and analyzed OSU's conversion and identified nine distinct phases in the process. The purpose of phase one was to create a critical mass of top management people who would be willing to support and test the concept. At the conclusion of phase one, the president and cabinet were enthusiastic about the potential of TQM. However, the initial response from the academic side of the university was negative, and they described it as just another management fad. In phase two, OSU established a pilot study team in the physical plant area that ultimately
improved service and morale in the department. Phase three focused on identifying customer needs through a process of quality function deployment (QFD). Through the use of tools such as customer surveys, focus groups, complaints, and comments, OSU learned that its marketing function was almost nonexistent and, therefore, lacked any awareness of customer-driven systems. Phase four identified priority breakthrough items, which is essentially a strategic planning process. Breakthrough items are activities designed to general quality improvements in the systems and procedures of an organization. This phase underscored the importance of the president’s participation in extensive planning sessions as well as the acknowledgment that the implementation of TQM processes throughout the university would take many years. Phases five, six, seven, and eight extended breakthrough planning in the university’s divisions, involved the formation of daily management teams, initiated cross-functional pilot projects and the implementation of cross-functional TQM. Phase nine set up reporting, recognition and awards systems.

Coate (1991) reported that at Oregon State, TQM was vital for the realization of its vision as well as for its continued survival in the marketplace. “Quality is what customers say it is, not what universities tell them it is” (p. 37). Coate acknowledged that although TQM is a simple concept, its application in the university setting proved to be a challenge. Coate commented that based on OSU’s experience, the successful implementation of TQM in a college or university depends on the observation of six key principles: (1) gaining support from the top management; (2) finding a champion who has considerable
authority; (3) acting quickly to form and operate teams; (4) assuring that teams are adequately trained; (5) utilizing breakthrough planning to assist with the alignment of work units and the integration of strategic planning processes; and (6) starting TQM on the service side of the university or college.

Syracuse University, Shaw (1993) described the two distinct factors that prepared the Syracuse University environment for TQM as motivation and means. The motivation for reform at Syracuse was the need to align the university's budget with its enrollment. A retrenchment effort was undertaken in certain areas of the university while other areas received budget add-ons as incentives. Shaw, the chancellor of Syracuse, noted that the strategic nature of the plan sent a clear message that the university was intent on focusing on its strengths. As one of the new initiative to capitalize on their strengths, TQM was initiated.

The means for bringing continuous quality improvement to Syracuse started at the top with the chancellor's cabinet. This management team opted to employ a gradual approach to TQM which required the training of existing top management, utilizing outside consultants who concentrated on awareness training as well as various TQM tools. The cabinet then hammered out definitions of the university's mission and vision.

The next step was the creation of four pilot teams—financial aid, bursar's operations, health services, and classroom environment. Team leaders and members received four days of intensive training to learn the skills required for successful TQM implementation. Shaw (1993) reported that beyond the
improved morale, many successes were posted by each of the pilot teams at the university. Additional successes also materialized from a new mindset on the campus that was not necessarily from the formal TQM approach.

Based on the experiences at Syracuse University, Shaw (1993) offered the following TQM checklist for those institutions ready to try the continuous improvement management style: (1) Allocate adequate time and resources to the training and implementation functions; (2) Use the power of example by studying the experiences of other TQM programs in both the private and public sector; (3) Communicate effectively across the institution about the ongoing efforts; (4) Address areas of quick and visible impact at the onset of the initiative to report early successes and maintain momentum; (5) Expect some anxiety and cynicism about TQM; (6) Adapt the effort to fit the environment, realizing that each institution will need to tailor TQM to its particular situation. Shaw explained, “...there is no perfect model, and we are willing to take the time to adapt the program to fit our needs” (p. 27); (7) Be willing to change—learn from experience and change approaches when necessary. For example, the intensity of training and work required in the early stages may not be necessary in all service areas; (8) Expect change which is a product of the new methods and improved services. Learning to live with change is one of the significant challenges of adopting the new approach; and (9) Don’t expect everyone to applaud the effort. There will be many critics of the attempts at being customer driven. Shaw noted that “...there also has been a steady hum of discontent to spur us toward even greater improvement” (p. 27).
Delaware County Community College (DCCC). Among the first two-year colleges to adopt the total quality management system was Delaware County Community College. Under the leadership of its president, Richard DeCosmo, the implementation of TQM was “the result of extensive study and training for top-level administrators at the college” (Entner, 1993, p. 29). It was determined that the total quality approach would provide tangible payoffs for the college which was faced with diminishing resources. DeCosmo, Parker, and Heverly (1991) maintained that a community college implements Total Quality Management to “conserve resources, improve effectiveness, capture the quality niche, and increase participation in decision making” (p. 13).

Entner (1993) reported that the commitment to TQM at DCCC was formulated into three goals: (1) to transform the college’s philosophy of management to total quality (TQ); (2) to develop training curricula and programming in TQ for businesses in the DCCC service area; and (3) to incorporate the concepts of TQ into curricula and classroom management. The college administration and board of trustees spent almost fifteen months re-examining the college’s philosophy, mission, goals, and strategies to ensure their continued relevance for the next decade.

Delaware County Community College used the Malcolm Baldrige criteria as a model to design its plan for a thorough emersion into total quality systems and practices. The executive staff was the first to be trained in TQM and was also responsible for developing the plan and identifying goals for TQ implementation. Entner (1993) noted that “when TQ planning was made a part
of regular staff meetings, it started to become an integral part of the college's processes" (p. 31). The members of the executive council were responsible for implementing TQM within their respective work units.

Entner (1993) reported that TQM awareness training was mandatory for all administrators and the majority of the support staff, and all new employees were expected to attend similar TQ training. Employees at the college also received just-in-time training, which allowed for special training concepts as it coordinated with the master TQ implementation plan. Faculty members were also involved in planning an orientation to TQ for faculty and were also responsible for exploring special projects that would bring TQ into the classroom.

The strategic planning processes at the college were focused by a ten-year plan and a three-year subset of that plan. All departments were involved in activities which supported the strategic goals. Quality improvement teams were formed as necessary to accomplish the identified tasks. All of the employees at DCCC were empowered to identify pilot projects which were handled with a teaming approach. Entner (1993) described some of the early successes as improvements in telephone communications, class scheduling, and reprographics. He emphasized that "the teamwork and communication involved in identifying and charting processes and related problems has provided a natural bridge to team problem solving" (p. 33). One of the benefits of implementing TQ principles was that the college staff were actively involved with one another in a process of documenting and standardizing college
operating procedures which may have previously wandered from their intended purposes.

The president of DCCC cautioned that TQ requires an intensive commitment: “Causing a cultural change, especially in a traditional institution, is not one for faint-hearted leadership” (p. 34). DeCosmo, et al. (1991) emphasized that the executive staff is convinced of the worth of the effort given to TQM implementation at DCCC. They concluded “Success in implementing TQM will allow DCCC to continue to meet the needs of its stakeholders well into the next century” (p. 23).

Virginia Commonwealth University, Cowles and Gilbreath (1993) described the adoption of TQM at Virginia Commonwealth University (VCU) as taking place while the institution was in a virtual state of turmoil—suffering from divided campuses and a decentralized organization with no common management philosophy as well as deep budget cuts and low morale among students, faculty and staff. None of these issues would suggest a fertile environment for the implementation of TQM, which requires cross-functional decision-making, consistency and constancy of purpose from the top management, and considerable initial investments of time and money (p. 282).

Interest in total quality management was piqued at the administrative level at VCU and subsequently was shared with the university’s academic administrator’s council. TQM emerged through a slow, arduous plan of tackling pilot projects to test the waters. Unlike most other institutions who have embraced the quality movement, VCU faculty members encouraged the
administration to view them as resources within the university who could contribute to service quality improvement efforts as well as share in the responsibility of such efforts. The faculty at VCU felt that quality concepts and tools were applicable to the teaching, research, and service activities of faculty.

To initiate the TQM effort, the faculty resource team hired a consultant who provided an independent view of TQM for the president’s council. Subsequently the consultant recommended that a quality council be formed. Instead, however, the president used the monthly council meeting as a forum for presentations about quality management. Several outside speakers were invited to share their experiences with total quality management. These speakers stressed the critical role of top management in supporting the effort as well as the importance of employee training. Cowles and Gilbreath (1993) noted “. . . key leaders were not inspired to embark on an intensive self-education program” (p. 287).

The pilot teams, guided by an outside consultant, tackled a series of improvement projects that had impact across the university. All of the attempted improvement efforts were considered to be beneficial. Not only were the initial problem conditions solved, but also there was improved communication and morale throughout the campus. Virginia Commonwealth University conducted an assessment of the TQM pilot projects. Members of the guidance and project teams participated in the summative climate assessment which confirmed that the participants wanted to provide quality services and believed that the goals they identified were realistic and achievable. They also identified what they
considered to be necessary conditions for the achievement of a continuous quality improvement process. These included: open lines of communication, employee involvement in decision making, cross-functional management, recognition of employees who make contributions to improve service quality, creating a climate of change, engaging in fact- and information-based decision making, and establishing clear lines of responsibility and accountability.

In a separate report to the president’s council, the faculty resource team emphasized that changing the atmosphere of a large organization like VCU requires changes on the part of the leadership of the organization. They noted that while there had been an infusion of total quality awareness and an appreciation of the effectiveness of TQM in certain areas of the university, key leaders at VCU had not acquired the depth of knowledge about TQM concepts to afford them the ability “to make an informed decision about adopting TQM as the philosophy for managing the institution” (Cowles and Gilbreath, 1993, p. 297). The faculty resource team recommended that the senior leadership of the institution participate in an intensive education program to include a level of knowledge sufficient to understand fully what it would mean to adopt TQM as its operational philosophy and to secure the services of one or more experts outside of the university to help top management through the initial transformation stages of TQM. The president’s council responded that the university was not in a position to pursue quality as the team had recommended. Instead quality efforts were to be under the direction of each of the vice presidential areas within the university. In the absence of a clear
university-wide TQM mandate, pilot projects were to continue but within specific functional areas.

Cowles and Gilbreath (1993) noted "Faculty resource team members view the current status of TQM at the University level as in a holding pattern, with a considerable amount of ongoing activity at subordinate levels" (p. 300). Those participants guiding the pilot projects felt that the top management's decision to stall the full implementation of TQM was preferable to a shallow commitment to the management philosophy. The critical issues in the implementation process at VCU can be summarized as: defining top management's role in the quality transformation, deciding the appropriateness of adopting or adapting the quality processes, learning to cope with change so there is improvement over the previous condition, and creating a quality culture.

Summary. All of the previous cases studies have a common thread of underlying issues which initially evoked interest in the new management philosophy. In addition, each of the institutions seem to have realized that certain essential elements relating to continuous quality improvement philosophies and methodologies appeared to be more conducive to a successful transformation. These essential elements align with the implementation characteristics which were identified as the core independent variables for this study.

Related Research on Quality in Higher Education

A search of the literature revealed several studies which have investigated issues pertaining to the philosophy, principles and/or practices of
continuous quality improvement processes in higher education (Anyaocha, 1984; Baas, 1995; Baugher, 1992; Brocato, 1994; Carroll, 1994; Dhiman, 1995; Fritz, 1993; Greene, 1994; Huang, 1994; Lazio, 1991; Miller, 1993; Moore, 1994; Rux, 1994; and Stiehl, 1992). A description of several of these studies was warranted as they related to the implementation characteristics of TQM.

Leadership. Dhiman (1995) explored the leadership issues involved in facilitating the transformation from the current management paradigm to a TQM-managed paradigm. Focus group interviews and an attitudinal survey were employed to collect data for the study which included participation by 140 academic leaders. The participants in the focus group interviews agreed on the following key challenges to leaders: (1) unfamiliar business language of TQM; (2) inveterate resistance by faculty; (3) individualistic reward/evaluation system in higher education; (4) departmental separatism; (5) the tradition-based orientation of higher education is resistant to change; and (6) the perception of TQM as a downsizing measure. The survey respondents strongly agreed with several of the findings which included the following: (1) improvement in outcomes was essential in order to regain public trust.; (2) higher education must rely more on performance than on resources in the wake of budget cuts and dwindling resources; and (3) leadership is critical to the success of TQM.

Huang (1994) also investigated the leadership role of presidents in total quality management efforts through an assessment of leadership styles and their relationship to performance of total quality leadership behaviors. The population study consisted of 120 presidents, administrators, and faculty at four-
year colleges and universities that had implemented the principles of TQM in the administrative functions. Two questionnaires were completed by the study population. The Leadership Behavior Description Questionnaire identified the two dimensions of leadership styles—consideration (people-oriented) and initiating structure (task-oriented). The Total Quality Leadership Behavior Questionnaire was also used to measure the presidents' performance of total quality leadership behaviors. The results of the study revealed that:

(1) presidents at the selected universities performed total quality leadership behaviors to a limited degree; (2) strong, positive relationships emerged between the two dimensions of leadership styles and the presidents' performance on quality leadership behaviors; (3) presidents indicating a high consideration/high initiating structure performed total quality leadership behaviors more often than the other presidents with other leadership styles; presidents with low consideration/low initiating structure tended to perform quality leadership much less than other presidents with other leadership styles; and a strong, positive relationship emerged between length of time of the TQM implementation in the college or university and the presidents' performance on total quality leadership. Huang concluded that in the quest for successful implementation of TQM, top-level administrators must modify or change their leadership styles to be high on both consideration and initiating structure dimensions in order for them to exhibit quality leadership behaviors.

TQM Implementation and Assessment. Carroll (1994) investigated the perceptions of the directors and coordinators of Total Quality Management
programs in higher education concerning the implementation and barriers associated with the quality initiatives on their campuses. In addition, the researcher examined the nature of administrative support for the quality effort at each institution. The research questions for this study concerned the implementation level of TQM, circumstances prompting the use of TQM, implementation barriers, program resources, and administrative support. The findings of this study led to several conclusions which were: (1) the implementation of TQM was only recently started in higher education; (2) external pressures provided the impetus to move the institutions toward total quality initiatives; (3) faculty resistance and lack of understanding of TQM methodologies presented a significant barrier to quality improvement; (4) commitment from top-level administrators was necessary for acceptance of TQM implementation; administrators did not model the behaviors necessary to reinforce the quality principles; and, (5) few institutions have experienced significant changes in the organization of senior staff since beginning TQM. Carroll recommended that future research on this topic might include investigation of both successful and unsuccessful TQM implementation projects and the identification of methodologies to successfully involve faculty in the quality movement.

In a study of 200 colleges and universities, Miller (1993) examined the degree to which Chief Student Affairs Officers (CSAOs) perceived the Malcolm Baldrige National Quality Award (MBNQA) criteria to be applicable to assessing quality processes in student affairs divisions. Respondents to the survey
evaluated the applicability of each criterion to the MBQNA, identified additional criteria, as well as strengths and weaknesses of the criteria. The MBQNA criteria were perceived to be applicable to assessing the quality of student affairs in higher education. In addition, the responses by student affairs officers also generated two potential additional criteria—the assessment of academic and student development outcomes and the quality of financial management. In terms of the seven categories of the MBNQA criteria, customer satisfaction and leadership were viewed as most applicable with quality results viewed as less applicable to higher education. It was also noted by Miller that the language and definitions employed in total quality management were perceived as complex by the study population.

Baugher (1992) applied the TQM approach to the academic classroom at Samford University through a process entitled LEARN, which allows teachers and students to address classroom learning issues. Student quality teams were used within the teaching and learning environment. The LEARN process supports the concept of continuous quality improvement. According to Baugher this process helped to establish a learning community in a time-on-task environment which is sometimes hostile to teacher-student discussion concerning course direction and problems. The researcher assessed the LEARN process and its materials through an outside expert evaluator, as well as by piloting the process in three classes at Samford. Other evaluation techniques included focus groups and participant observation, both of which indicated initial success for the student quality team process.
Strategic Planning and TQM. Moore (1994) explored the compatibility of strategic planning and total quality management in higher education institutions and the extent to which quality conceptions were clarified when both processes were used. A qualitative research method was used to conduct case analyses at three higher education institutions. Qualitative content analysis was used to synthesize and analyze a data base consisting of 52 interviews and extensive written documentation. The findings of the study indicated that strategic planning and TQM were generally complementary although conflicts can arise. The data suggested that there were nine areas of compatibility and four areas of potential conflict between the two processes. The researcher posited that the combination of both processes may equip higher education institutions to address the prerequisites for institutional survival and institutional effectiveness. In addition, the researcher suggested that the synthesis of strategic planning and total quality management into an integrated system could provide benefits to a university which outweigh those provided by implementation of either process in isolation.

Implementation of TQM through Training Programs

Training is a recurring theme in successful total quality transformations. Such transformations require the involvement of all employees in continuous quality improvement efforts. Respondents to a 1993 multilevel survey about total quality management selected training and leadership commitment as the most important factors in any quality program ("TQM: Dead or Alive?", 1993, p. 63).
Deming's (1986) points 6, 7 and 13, all speak to the importance of training to support employee involvement and empowerment. One of the seven critical success factors identified by Ishikawa (1986) as essential for the success of total quality control is "education and training in all aspects of total quality, which often amounts to thirty days per year per employee" (p. 38). He emphasized that total quality control begins with education and ends with education.

Juran (1992) maintained that adoption of modern ways of planning for quality requires training in how to plan for quality. Such training must be extended throughout the organization—for all functions and at all levels. Stuelpnagel (1989) emphasized that "dramatically more education and training is required with TQM" (p. 7). He noted that the most important single factor contributing to Japanese successes in world markets was said to be their continual education and training systems in quality improvement for all employees.

In a survey of 160 colleges and universities at various stages of quality management process, Horine and Hailey (1995) found that the training function was considered to be one of the key challenges to successful implementation. Respondents to the survey commented that education and a basic understanding of the key philosophy was critical as well as a methodology for engendering interest and enthusiasm for continuous quality improvement throughout the organization. In addition, the study participants recommended that training be provided for everyone (including top management) on an
on-going basis. These authors concluded that training and development at all levels of the institution are required to sustain quality practices.

Cornesky, McCool, Barnes, and Weber (1991) suggested a process to determine an institution’s quality index and stressed the education of administrators, faculty, and staff as necessary conditions for implementing total quality improvement processes. They recommended that the professional development activities of the faculty and staff should include an understanding of quality philosophies and processes as well as training on the tools and techniques needed to implement total quality management. The obvious reason for educating all employees about the process is to underscore the importance of their participation so that the movement will be successful.

Fields (1993) observed that it may seem odd to emphasize the importance of training to people in the training business. He continued that total quality in education is a new way of doing things for many people, and this requires training. The training program for total quality management must emphasize why, who, what, how, and when all things will happen and must be of a high caliber and pertinent to the level of the learner.

Implementation Characteristics of Training Programs

In order to achieve effective continuous quality improvement systems, there are essential elements to be learned, and the training function is considered to be a vital catalyst to the attainment of this goal (Cornesky, 1990; Deming, 1986; Ishikawa, 1986; and Juran, 1992). Holpp (1989) held that, unquestionably, training is the glue that binds total quality improvement efforts
and describes the needed training as being: (1) delivered on the job, with lots of application time and reality based; (2) delivered just in time, and coordinated with the needs of the team; (3) conducted by line people made up of team members, leaders, supervisors, managers, and executives; (4) provided to employees at all levels simultaneously so that clear messages are reinforced all at once; (5) skill based, with measurable, observable and attainable outcomes; and (6) reinforced by performance measures that make the training stick and seem important. He offered examples of many corporations who are committed to training for TQM because the skills and knowledge needed for this management system are not readily available in the work force.

Coate (1990) stressed that how the TQM process is implemented is as important as what the process includes. In TQM, all employees commit daily to improving the quality of their service so that customers' needs are met or exceeded. Coate (1993) reported that at Oregon State University, the human resources department prepared training materials, including a manual, and set up a regular schedule of three-day TQM training sessions. Between 1990 and 1991, 120 members of the institution's staff and faculty had attended the sessions, and representatives from other colleges and service organizations have asked to visit the university and attend its TQM training.

Howard (1993) emphasized that employee training and development is a critical element in the pursuit of TQM. As quality manager at Oregon State University, Howard developed and delivered TQM training and has described four major components to the training program: introductory training, strategic
planning, team training, and special topics. She suggested that the role of the quality manager has to develop, evolve, and change as institutional needs change.

Implementing TQM in any organization constitutes a revolution in thinking and an evolution in practice. At Delaware County Community College, DeCosmo, Parker and Heverly (1991) theorized that since consistency and constancy of purpose are essential to change, the first step is the education of the executive team. Most teams realize early on that the set of assumptions underlying the style of management required by TQM differs from the assumptions underlying the current style of management in higher education institutions. Butler (1990) cautioned that in order for TQM to be embraced by an entire organization, there must be a constant leadership effort that is sincerely committed to making this change. The management officials must lead this initiative.

In an interview with Marna C. Whittington, Executive Vice President at the University of Pennsylvania, Marchese (1992) posed the question “. . . Penn is three years down the quality road, what’s your advice now for colleagues in other institutions?” Whittington responded:

First, there must be commitment from the top and a willingness for executive leadership to get involved. That means making time to put quality on your calendar. Second, there has to be training, training, and more training, but what in TQM we call just-in-time training, that is, education and tools tailored for immediate application. (p. 14)
Juran (1992) believed that training in how to plan for quality is multidimensional; and, therefore, an organization must establish a training curriculum that includes the fundamental tools and methodology of quality disciplines that are widely applicable. Spanbauer (1992) contended that in order to ensure constant awareness and to promote understanding of each individual's role in keeping the quality concept going, a strong staff education program is required. This training program will then provide the techniques and skills needed by the staff to utilize quality improvement processes within their specific work units. He suggested that higher education institutions use a model during training—such as those advocated by Deming, Crosby, and Juran. As implementation moves forward, however, most organizations will eventually design their own, as did Fox Valley Technical College which originally used the Crosby 14-step model and then designed its own 16-step plan.

Stieber (1991) identified the primary implementation characteristics of effective quality improvement training programs in private organizations as including: (1) a philosophical approach; (2) effective program content; (3) making new skills and quality endeavors part of performance appraisals; (4) delivery effectiveness which includes the use of internal and external resources as appropriate and the involvement of managers and supervisors as trainers; (5) conducting pilot programs; and, (6) the appropriate scheduling of training sessions. In addition, current research indicates consistently that upper management support or leadership along with a mandated approach to training
is critical to the effective implementation of continuous quality improvement processes (Horine, 1995; Juran, 1992; Deming, 1986; Ishikawa, 1986).

Evaluation of Training Programs

As in any teaching and learning environment, it is essential that there be a methodology for assessing how well the training process works and how successful the participants have been in learning the new material. Port and Smith (1992) reported that companies often do not link quality efforts to the bottom line. For example, many quality companies that initiate team training can count off how many people are being trained but few can provide data on what difference the training makes in performance.

Tracey (1968) stated that evaluation should provide a means for improving the programs and services offered by the training activity for the benefit of the enterprise and its employees. A systematic follow-up plan is necessary to ensure improvement in all of the sub-systems of the organization. Tracey maintained that failure to take follow-up action would mean that the resources used in the evaluation were wasted.

Michalak and Yager (1979) emphasized that the evaluation of training has seldom received the attention it deserves. Typically training programs will be evaluated at the level of participants' reactions and perhaps even at the level of the trainees' knowledge or skill, or both. Vaught et al. (1985) concurred that overall the evaluation of training programs was poor and emphasized only reactionary measures. “Evidence of material learned or behavior change on the
job are very seldom used” (p. 165). These authors underscored that the evaluation stage is critical to improving employee development programs.

Tracey (1968) recommended that training be evaluated from two different but complementary perspectives—through the application of internal and external criteria. Internal criteria are used to measure the result of the training itself and includes content measurement, pre- and post-testing, participant reactions, measurement against specific standards, and experimental research such as using a control group. External criteria are used to measure the results of programs after the employee returns to the work unit. This methodology utilizes reports, observation, interviews, questionnaires, work samples and statistics. Tracey stressed that the fundamental question concerning training evaluation is: “What is important to know about this organization and its people to determine whether the training and development activity is doing what it is expected to do and doing it well?” (p. 35).

Vaught, Hoy, and Buchanan (1985) determined that there were flaws in the evaluation process of training programs which included: (1) procedures which were often performed poorly and haphazardly; (2) superficial evaluations which did not fully address program effectiveness; (3) the limitations of evaluations in terms of organizational and personal objectives; (4) the lack of specificity in the relationships between evaluation and accountability; (5) the lack of observable and measurable benefits from the training program; and (6) the lack of organized support from all management levels for the training program (p. 145). These authors maintained that the evaluation of training
programs is important to ensure that training resources are being effectively and efficiently spent. Additional reasons identified for evaluating programs were to gain assurance that the programs offered matched organizational needs, to ensure future program improvement, and to maintain human resource development in the short and long run.

Krein and Weldon (1994) maintained that a training program's success can be gauged only through thorough evaluation, both formative and summative. The formative evaluation process involves checks made during the program development process. The summative evaluation process takes place at the end of the program, to determine whether or not the desired outcomes were met. These authors espoused Kirkpatrick's four levels of evaluation as an means to achieving this end.

Measures of Training Effectiveness

Kirkpatrick (1975) stated that training programs can be evaluated at the following four levels: Level 1, The trainee reactions; Level 2, The change in trainee learning; Level 3, Behavior change on the job; and Level 4, The results to the organization. Level 1 – Reaction is defined as how well the trainees liked a particular training program. It is the same as measuring the feelings of the participants and does not include any measurement of learning taking place. Kirkpatrick stated that since reaction is so easy to measure, nearly all training directors do it; however, little indication of the results that can be attributed to the training program exists at this level of evaluation. Michalak and Yager (1979) noted that reaction questionnaires will yield some important information that will
assist trainers in improving the training program. Questions which relate to the quality of instruction methodology, the quality of the instructor, the facilities, the parts of the program that are relevant to jobs and the parts that are not, the value of pre-work assignments, all contribute to information that is valuable to the trainer. Krein and Weldon (1994) suggested that Level 1 evaluation could reveal certain facts such as: how relevant participants thought the training was; whether the participants were confused by any of the training; whether any areas of the training were lacking in information; how engaged the participants felt by the training; and how favorable overall participant reactions were (p. 64).

Level 2 — Learning is defined as the principles, facts, and techniques that were understood and absorbed by the participants (Kirkpatrick, 1975). Evaluation at this level is considered to be much more difficult since it involves a great deal of work in planning the evaluation procedure, in analyzing the data that is obtained, and interpreting the results. The type of methodology used at this level of evaluation is dependent on the nature of the training program. In some cases a pretest, post-test methodology may be appropriate; while in another training session, demonstration of learned skills may be the desired technique. Krein and Weldon (1994) cautioned that if a pretest is not administered, the possibility that participants could have achieved the objectives before the training is missed. Michalak and Yager (1979) recommended that testing be done at the end of a training program in order to: (1) find out whether the trainer has done the job as well as it should have been done; (2) determine whether the design of the training program has brought
about the learning that was anticipated; and (3) give feedback information to
the trainees so that they will know how much they have learned.

Level 3 - Behavior is defined as using the knowledge and skills learned
in the training program on the job. Kirkpatrick (1975) stressed that this type of
evaluation is more difficult than the reaction and learning levels of evaluation.
He maintained that a more scientific and statistical approach is needed at this
level and also acknowledged that very few training directors have the
background, skill or time necessary to engage in extensive evaluations.
Michalak and Yager (1979) suggested that a pre-training measurement be
taken to assure an accurate evaluation at this level. Krein and Weldon (1994)
proposed questionnaires as a means to reducing costs associated with Level 3
evaluation. In addition, they espouse the use of focus groups for gathering
feedback.

Level 4 - Results is defined as the improvement achieved in whatever
category the training was designed to effect. According to Kirkpatrick (1975),
this type of evaluation is considered to be the least utilized in training programs
and is considered to be time intensive and less dependable because of
extraneous variables which may be responsible for the noted change or results.
Michalak and Yager (1979) pointed out that the purpose of the training program
was because a problem was brought to light. Therefore, they suggested that the
question that needs to be evaluated at the end of the training is “Did this
problem go away?” Still, they maintain, the comment may be “so what?” if other
answers are not readily available to additional questions such as: “What are the
results to the organization? Has profitability improved? Is the organization more effective now as a result of the training? According to these authors, successful training must produce results for the organization, and these results must be recognized by management.

Chapter Summary

In summary, the literature provides a liberal sampling of the on-going efforts to implement the principles of continuous quality improvement processes in higher education, but whether or not this management system is compatible with the academic environment and its decision-making models is still unclear. What has been revealed through a scrutiny of the literature, however, is that higher education institutions are increasingly demonstrating interest in continuous quality improvement philosophies and practices and are undertaking a systematic process for training in the principles of total quality management. Interestingly, academe has shown a preference to refer to TQM as continuous quality improvement while typically adhering to the essential points that Deming has prescribed. Within the training program activities, certain implementation characteristics have been identified, both in research and case studies, as being significant to the effectiveness of training as well as to CQI implementation.

As institutions of higher education face critical decisions and challenges concerning retrenchment, enrollment management, outcomes assessment, accountability, and numerous other issues, it is essential to ascertain the
benefits accrued and problems that might arise when institutions implement new management systems. The wide-scale adoption of the principles of continuous quality improvement in higher education would be a pronounced transformation best described by Seymour as no less than a paradigm shift (1991). Formulating appropriate responses to address the concomitant change that is inevitable with a paradigm shift to continuous quality improvement processes is critical to its successful implementation. Information about the mechanisms used to execute the training process and an analysis of the perceptions of how effective the training has been will assist those administrators who are or will be embarking on the continuous quality improvement journey.
CHAPTER III

PROCEDURES FOR DATA COLLECTION

Research Design

The purpose of this study was to identify and describe the implementation characteristics of continuous quality improvement training programs and to determine whether or not and to what extent relationships exist between the implementation characteristics and training program effectiveness, as perceived by selected individuals at two- and four-year colleges in the United States. To accomplish this objective, a descriptive research design was selected and a mailed questionnaire was used to gather the data. Anecdotal comments were also used for further clarification and enhancement.

Study Population

This study focused on a systematic sample population of those individuals at two- and four-year colleges and universities in the United States who were identified in the literature as subscribing to a continuous quality improvement process or total quality management. Borg (1987) stated that:

Systematic sampling, like simple random sampling, is used to obtain a sample from the defined population. This technique can be used if all members in the defined population have already been placed on a list such as a membership list or a school census. (p. 88)
A mailing list was compiled from information reported in the October 1991, 1992, 1993, and September 1994 issues of Quality Progress which identified two- and four-year colleges and universities that had indicated involvement in continuous quality improvement processes on their campus. This data was then cross referenced with similar information which was published in Total Quality in Higher Education (Lewis and Smith, 1994). The resultant study population was comprised of 362 four-year colleges and 162 community colleges, for a total of 524 higher education institutions from across the United States. Administrators, quality coordinators, training managers and/or human resource directors were considered to be the collegiate representatives most likely to have information on both effectiveness and implementation issues associated with continuous quality improvement training efforts.

The Survey Instrument

The survey instrument used in the study was a comprehensive questionnaire which was modeled after an instrument used by William G. Stieber in his 1991 dissertation, Implementation Characteristics of Effective Quality Improvement Training: A Descriptive Study. There were no published instruments known to assess implementation characteristics of effective training programs for continuous quality improvement or total quality management at higher education institutions in the United States. Modifications to the original instrument were based on the differences of the populations studied (corporate versus educational entities) as well as from the suggestions offered by the
panel of experts in the instrument validity phase and the additional findings from
the pilot study.

The revised, twenty-one item questionnaire was designed to reflect
various implementation characteristics of a continuous quality improvement or
total quality management training program and the perceived effectiveness of
such training programs. The questionnaire included both dependent variables
(items addressing program effectiveness) and independent variables (items
related to the implementation characteristics). Survey items 4, 5, 6, and 8, which
addressed program effectiveness, were based on the four levels of training
program evaluation proposed by Kirkpatrick (1975). These levels included:
(1) participant reaction to training; (2) actual learning; (3) behavior change; and
(4) organizational change results. The four items in the survey instrument
relating to training effectiveness asked whether the quality improvement training
program had been evaluated by each of these approaches and what the results
and/or methodology of these evaluations had been. Using Likert-type scales,
respondents reported the results of these distinct levels of evaluation.

If respondents answered in the affirmative that they had evaluated the
quality training program by determining if positive organizational change had
occurred as a result of the training, they were asked to identify which area(s) of
the institution had been evaluated—e.g., leadership, work environment, work
processes, customer service, classroom environment, or other areas. The
remaining items on the questionnaire were designed to determine the
implementation characteristics of the quality improvement training program and
used both Likert-type scales and categorical responses.

The research questions and hypotheses explored in this study
essentially asked the question: What implementation characteristics are
important to the quality training program process, and what is the nature of the
relationship between each of the identified implementation characteristics and
training program effectiveness? The implementation characteristics were
reflected in the survey instrument as follows: Item 1: a conditional item which
determined if quality training was currently underway or had taken place; Item 9:
which asked whether an institution's training program is supported by a
particular quality philosophy or tool; Item 10: which asked what specific content
segments are included as part of the overall quality improvement training; Item
11: which asked the degree to which the organization's top-level administrators
are committed to the training initiative; Items 12, 13: which asked whether
attendance at training sessions and using the skills taught in the quality training
program on the job is made part of the employee's self-assessment; Items 14,
15, 16: which asked the extent to which the institution utilizes its own employees
versus external consultants as trainers and the perceived effectiveness of each,
as well as the extent to which the institution uses supervisors or managers as
instructors in the training program; Items 17, 18: which asked whether pilot
programs were used, in which work units of the institution, and the extent of
evaluation assessment of the training; Item 19: asked whether training in quality
improvement is mandatory for employees and the percent of those employees
not required to attend training who attended voluntarily; and Item 20: which asked whether the training was scheduled continuously or at periodic intervals. Information categorized as institutional demographics included: number of students enrolled, number of employees, the type of institution (two- or four-year), whether it was a public or private college, the type of position held and title of the respondent, the number of years that the institution has been involved in continuous quality improvement processes, the employment status of the designated quality improvement coordinator, and the estimated annual budget designated for the quality improvement training program.

Instrument Validity

The survey questionnaire was modeled after an instrument used by William G. Stieber in his 1991 dissertation, Implementation Characteristics of Effective Quality Improvement Training: A Descriptive Study. There were no published instruments known to assess implementation characteristics of effective continuous quality improvement or total quality management training programs at higher education institutions. The survey instrument was assessed for content validity by a panel of experts. Kerlinger (1986) noted that “Content validation consists essentially in judgment. Alone or with others, one judges the representativeness of the items” (p. 418).

Nationally known individuals who have expertise in the field of continuous quality improvement in higher education were asked to participate in the review of the instrument. (The transmittal letter and a list of the
participants is included in Appendix A. These experts were identified by their publications, appearances, and consulting work in continuous quality improvement as well as through recommendations from practitioners in the field. The panel of experts included: Robert Cornesky, Owner, Total Quality Management Consultants, Port Orange, Florida; Margo Hirsch, Director of Quality and Planning, Dallas County Community College District, Dallas, Texas; Maudie L. Holm, Director, Organizational Development, Cuyahoga Community College, Cleveland, Ohio; Art Lacy, Director of Group Education, Texas Instruments, Dallas, Texas; Carol Mishler, Project and Research Services Manager, Fox Valley Technical College, Appleton, Wisconsin; Daniel Seymour, Author and Owner of Q Systems, Palm Springs, California; and Stanley Spanbauer, National Quality Academy, Appleton, Wisconsin.

An abstract of the proposed study as well as the prototype survey instrument was mailed to each of the panel members who were asked to agree or disagree with the items in the survey, to indicate if each item was an appropriate statement, to comment on the clarity of each question, and to write any comments or suggestions related to the implementation characteristics and measures of effectiveness for continuous quality improvement training programs. No item was discarded through this analysis. All responses submitted by the panel of experts were reviewed for changes in the survey instrument, including clarifications of wording and improvement of the format. Those items determined by consensus of the panel as needing revision were changed. The revised instrument was then used to conduct the pilot study.
Instrument Reliability

Bell (1987) advocated that all data gathering instruments should be piloted to test how long it takes recipients to complete them, to check that all questions and instructions are clear and to enable the researcher to remove any items which do not yield usable data. Sax (1979) concurred that pilot studies can be useful to “determine if the items are yielding the kind of information that is needed” (p. 258). Therefore, the survey instrument was mailed to a portion of the systematic sample of selected individuals at the two- and four-year colleges across the United States that were previously identified in the literature as subscribing to a continuous quality improvement process and which mirrored the intended population.

Because the pilot study was limited to using a portion of those institutions determined in the already limited systematic sampling, the normal procedure of using two distinct populations to determine reliability was not an alternative. While there are a number of devices available for checking reliability in scales and tests, these methods are not always feasible or necessary. Bell (1987) stated that “. . . such checking mechanisms will not be necessary unless you are attempting to produce a test or scale. The check for reliability will come at the stage of question wording and piloting of the instrument” (p. 51).

The questionnaires completed by pilot sample respondents were compared to the later responses from their respective institutions. Also norms of these responses were compared to the norms of the final completed surveys. There were small differences noted between responses from these individuals
and the later responses sent to other individuals at the same institution. These indicators were used to imply reliability since the normal pretest and post-test procedures could not be used. It is likely that a subsequent administration of the same instrument would reflect only those changes resulting from the time delay of the first administration.

Procedures for the Collection of Data

This study was designed to identify and describe the implementation characteristics of continuous quality improvement or total quality management training programs and to investigate the relationships between the major implementation characteristics and their effectiveness as perceived by selected individuals at two- and four-year colleges in the United States. A questionnaire packet containing a cover letter, the survey instrument, and a stamped, addressed, return envelope was mailed to the chief executive officers and training managers and/or quality professionals at selected higher education institutions that were identified through the literature as having a continuous quality improvement process or total quality management system in effect. Four weeks after the initial mailing, a follow-up postcard was sent to non-respondents. Additional follow-up procedures were utilized with non-respondents and included a second follow-up letter, telephone calls, and e-mail communication in an attempt to achieve a greater return rate. Studies have shown that follow-ups or reminders are the most effective method to increase the response rate, and two reminders have yielded as much as 20 percent more
responses (Kanuk and Berenson, 1975; Warwick and Lininger, 1975). Copies of the materials which comprised the questionnaire packet are included in Appendix B.

**Procedures for Analysis of the Data**

As the survey instruments were returned, the scores were coded into a data file. Each survey instrument was identified by an institution code and a respondent-type code (Administrator, 1; Staff, 2; Faculty, 3). The aggregate response data was tallied, statistically computed using BMDP Statistical Software, analyzed, and interpreted.

The data were interpreted descriptively and included frequencies, percentages, measures of central tendency, standard deviations, and standard errors. Analytical tables were utilized to report the research data from the collected raw scores generated by the survey instrument. These tables included information relating to the research questions, supporting indicators, and the respondents’ comments.

The data were also analyzed to determine if and to what extent relationships existed between implementation characteristics and the four levels of program effectiveness identified by Kirkpatrick (1975). This was accomplished through Spearman ranked, non-parametric correlation coefficient analyses of the independent and dependent variables to determine which implementation characteristics were significantly related to training program effectiveness. Those implementation characteristics that were related to
program effectiveness at the .05 level of significance were then submitted to a series of stepwise multiple regressions to determine the relative importance of each predictor variable to the four measures of program effectiveness—reaction, learning, behavior, and organizational change.

The two hypotheses which were derived from the research questions were tested using a multivariate analysis of variance (MANOVA) statistical technique. The assumptions underlying MANOVA were tested using Levene F tests. To test equal variances when they were not met, separate t tests were reported; and pooled t tests were reported when the assumption of variance was met.
CHAPTER IV

PRESENTATION AND ANALYSIS OF THE DATA

Introduction

The problem of this study was to identify and describe the implementation characteristics of continuous quality improvement training programs and to determine whether or not and to what degree relationships exist between the implementation characteristics and training program effectiveness, as perceived by selected individuals at two- and four-year colleges in the United States. The specific purposes of this study in relation to the perceived effectiveness of training programs for the implementation of continuous quality improvement processes at selected higher education institutions were to:

1. identify through the literature and verify through experts the extent to which higher education institutions are involved in continuous quality improvement training programs;

2. describe how the institutions are organized for training personnel in the philosophy and tools of total quality management;

3. determine which methods of training are perceived to be effective in implementing the total quality management philosophy in higher education institutions;
4. describe the best practices for total quality management training at selected higher education institutions;

5. describe the impact of total quality management training programs within these institutions; and

6. provide information and direction for professionals charged with making decisions associated with the implementation of training programs for total quality initiatives in higher education institutions.

The purpose of this chapter is to present and analyze the data which was collected in order to answer the research questions and test the hypotheses which were stated in Chapter I. For convenience, the questions posed from the purpose of the study, along with the two hypotheses derived from the research questions, are presented in the first part of this chapter. The chapter is then divided into nine sections which include: (1) a report of the distribution and rate of return, (2) demographic information on who responded to the survey, (3) a profile of the participants and processes involved in quality training, (4) an analysis of the measures of effectiveness and training program outcomes which addresses how quality training programs are being evaluated and the results of those evaluations, (5) an analysis of training program implementation characteristics and descriptive information concerning philosophy, tools, and content segments of quality training, (6) an analysis of the relationships among and between major implementation variables associated with quality training through the use of correlation matrices, (7) an examination of specific correlations between training program variables and outcome measures.
through the use of correlation matrices among implementation characteristics and matrices of the correlations of major implementation characteristics and outcome measures, (8) multiple regression analyses to predict outcome variables from the statistically significant implementation characteristics, and (9) an analysis of the results obtained when testing the two hypotheses which were derived from the research questions.

It is important to note that not all respondents reported information for every item on the survey instrument and may have erroneously failed to complete each item response. In other cases, respondents did not have current information for each item, which they indicated by stating that they had not assessed or evaluated their quality training efforts since they were involved in the initial implementation stages of quality training as they completed the survey instrument.

Restatement of the Research Questions and Hypotheses

Research Questions

The following research questions were investigated to identify and describe the implementation characteristics of continuous quality improvement training programs and to facilitate an examination of the nature of relationships between implementation characteristics and training program effectiveness for quality training initiatives, as perceived by selected individuals at designated higher education institutions in the United States:

1. What is the demographic profile of those higher education institutions involved in quality improvement training?
2. To what degree is participation in quality improvement training programs voluntary?

3. To what extent have various levels of personnel in the college received training in continuous quality improvement practices?

4. How is quality improvement training scheduled: as one continuous session, or at periodic intervals with employees returning back to the job between sessions?

5. To what extent have training program participants taken part in any evaluation assessment of quality improvement training?

6. To what extent has quality improvement training been evaluated by various assessment methods?

7. To what degree have specific quality philosophies or tools supported the quality improvement training efforts?

8. To what extent have specific content segments been used as part of the quality improvement training process?

9. To what degree has the institution's top management supported the quality improvement training program?

10. To what extent is participation in quality improvement training and the use of the new skills on the job made a part of performance reviews?

11. To what extent do institutions utilize external consultants versus their own internal staff as trainers in the quality improvement training program, and is there a difference in the perceived effectiveness of the training provided by each?
12. To what extent are managers or supervisors involved in the instruction for the quality improvement training program?

13. To what extent are pilot projects used and appropriate groups trained for continuous quality improvement?

14. To what extent do two- and four-year colleges allocate funding for the quality improvement training process?

15. To what extent does the allocation of funding for training in continuous quality improvement at two- and four-year colleges influence the perceived effectiveness of training?

16. To what extent do relationships exist between the major implementation characteristics or training program variables associated with continuous quality improvement training programs?

17. To what extent are there relationships between implementation characteristics or training program variables and perceived quality training program effectiveness?

18. To what extent do selected individuals at two- and four-year colleges differ in their perceptions of the effectiveness of continuous quality improvement training programs at their institutions?

Hypotheses

In order to address certain research objectives, the following hypotheses were proposed:

Hypothesis 1 (Research Question 9): There will be no significant difference between administrators, faculty, and staff, at two- and four-year
Hypothesis 2 (Research Question 18): There will be no significant difference between administrators, faculty, and staff, at two- and four-year colleges, in their perceptions of the effectiveness of continuous quality improvement training programs at their institutions.

Report of the Distribution and Rate of Return

The study population was comprised of 362 four-year colleges and 162 community colleges, for a total of 524 higher education institutions from across the United States. These institutions were identified in the October 1991, 1992, 1993, and September 1994 issues of Quality Progress as being involved in continuous quality improvement processes. This data was then cross-referenced with similar information which was published in Total Quality in Higher Education (Lewis and Smith, 1994). Administrators, quality coordinators, training managers and/or human resource directors were considered to be the collegiate representatives most likely to have information on both effectiveness and implementation issues associated with continuous quality improvement training efforts.

A questionnaire packet containing a cover letter, the survey instrument, and a stamped, addressed, return envelope was mailed in May, 1995, to the sample population which consisted of the chief executive officers and training managers and/or quality professionals at the 524 two- and four-year colleges.
that were identified through the literature as having a continuous quality improvement process or total quality management system in effect. Four weeks after the initial mailing, a follow-up postcard was sent to non-respondents. Additional follow-up procedures were utilized with non-respondents and included a second follow-up letter, telephone calls, and e-mail communication in an attempt to achieve a greater return rate. Copies of the materials that comprised the questionnaire packet and were mailed to the study participants are presented in Appendix B.

The target response rate for this survey was 80% or at least 419 responses from both two- and four-year colleges. While the 80% return rate was not achieved, 332 institutions did respond to the survey for a 63% return rate. Rea and Parker (1992) confirmed that when conducting mail-out surveys, it can be reasonably expected that the procedure will yield a response rate of 50% to 60% for the general public and somewhat higher for specialized populations. They stated that a response rate of 50% to 60% can be considered satisfactory for purposes of analysis and reporting findings.

Of the 332 institutions that returned the survey instrument, only those who indicated that they provided training in continuous quality improvement (n=211) were included in this study. It is important to note that the target population of 524 colleges consisted of approximately 31% two-year and 69% four-year colleges, which is almost identical to the return rate percentages. The total response rate results by type of college and CQI training involvement are presented in Table 1.
### Table 1

**Return Rate by Type of College and CQI Training Involvement (n=332)**

<table>
<thead>
<tr>
<th>Type of College</th>
<th>CQI Training Provided</th>
<th>CQI Training Not Provided</th>
<th>Totals</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-Year Public</td>
<td>85</td>
<td>37</td>
<td>122</td>
<td>36.7</td>
</tr>
<tr>
<td>Two-Year Private</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td>Four-Year Public</td>
<td>84</td>
<td>47</td>
<td>131</td>
<td>39.5</td>
</tr>
<tr>
<td>Four-Year Private</td>
<td>40</td>
<td>36</td>
<td>76</td>
<td>22.8</td>
</tr>
<tr>
<td>Totals</td>
<td>211</td>
<td>121</td>
<td>332</td>
<td>100.0</td>
</tr>
</tbody>
</table>

While a greater number of respondents were from the total sample of the four-year institutions, there were almost equal responses from both the two- and four-year public institutions. Of the 124 responding four-year colleges indicating involvement in quality training, 33% were from private institutions; and of the two-year respondents indicating involvement in quality training, less than 3% were classified as private institutions.

Those institutions which responded that they did not provide their employees with training in quality improvement processes offered some insight as to why they had either abandoned training practices for continuous quality improvement or explained that they were at the beginning stages of the implementation process. Verbatim comments from these respondents are included in Appendix C.
Demographic Profile of Respondents Involved in CQI Training

A summary of the pertinent demographic data concerning those respondents who are currently involved in continuous quality improvement training is presented in response to the first research question: What is the demographic profile of those higher education institutions who are involved in quality improvement training? This information includes the college size, the number of employees, the respondent's position and title, the length of time involved in quality improvement practices, and an identification of the individual who is responsible for quality improvement efforts.

Enrollment and Employee Size

Table 2 lists the range of full-time equivalent student enrollment and number of employees at both the two- and four-year colleges that indicated involvement in training for continuous quality improvement.

Table 2
Range and Mean of FTE Students Enrolled and Number of Employees at Two- and Four-Year Colleges Involved in CQI Training (n=211)

<table>
<thead>
<tr>
<th>College Type</th>
<th>Range</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-Year Colleges</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-Time Equivalent Students</td>
<td>500 - 33,000</td>
<td>6,149</td>
</tr>
<tr>
<td>Number of Employees</td>
<td>62 - 6,200</td>
<td>620</td>
</tr>
<tr>
<td>Four-Year Colleges</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-Time Equivalent Students</td>
<td>500 - 70,000</td>
<td>12,976</td>
</tr>
<tr>
<td>Number of Employees</td>
<td>65 - 17,785</td>
<td>3,105</td>
</tr>
</tbody>
</table>

Whether in a two- or four-year college, it appears that the implementation of continuous quality improvement practices is not impacted by size—either
large or small—in terms of student enrollment or number of employees. The range in each category indicates that both large and small colleges are interested in quality improvement, and the number of employees does not appear to be a delimiting factor for the implementation of quality improvement training programs.

**Employment Position of Respondents**

The survey respondents were asked to indicate their employment position as one of three choices: administrator, staff, or faculty. This information is presented by institution type in Table 3.

**Table 3**

<table>
<thead>
<tr>
<th>College Type/Position</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-Year Colleges</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administrators</td>
<td>70</td>
<td>83.3</td>
</tr>
<tr>
<td>Staff</td>
<td>3</td>
<td>3.6</td>
</tr>
<tr>
<td>Faculty</td>
<td>11</td>
<td>13.1</td>
</tr>
<tr>
<td>Totals</td>
<td>84</td>
<td>100.0</td>
</tr>
<tr>
<td>Four-Year Colleges</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administrators</td>
<td>71</td>
<td>59.2</td>
</tr>
<tr>
<td>Staff</td>
<td>26</td>
<td>21.7</td>
</tr>
<tr>
<td>Faculty</td>
<td>23</td>
<td>19.1</td>
</tr>
<tr>
<td>Totals</td>
<td>120</td>
<td>100.0</td>
</tr>
</tbody>
</table>

At both the two- and four-year colleges, the majority of the respondents were classified as administrators, for a total of 69%. Those respondents who
indicated their position as staff, accounted for 14% of the total; and those who indicated their position as faculty, accounted for the remaining 17%. The breakdown of percentage of responses from the various types of employee groups appeared to be similar to those identified in the sample population.

Respondents were also asked to provide their job titles on the survey instrument. The various job titles which were identified included president, assistant to the president, vice president, provost, dean, quality coordinator, director of quality, director of institutional research and planning, director of human resources, professor, and associate professor.

**Number of Years Involved in CQI**

In response to the survey question concerning the number of years the institution had practiced quality improvement, 30% of the total respondents indicated between two to three years (n=208). Fifty-nine percent of the two-year colleges indicated that they had been practicing quality improvement between two and five years (n=84). Only 3% of the two-year colleges reported involvement in quality processes for more than eight years. Of the four-year college respondents, 65% indicated that they had practiced quality improvement between two and five years, and less than 3% of the same type of institutions reported involvement for more than eight years (n=118).

**Designation of Quality Improvement Personnel**

The survey instrument also included the questions: Does your institution have a designated quality improvement coordinator? If not, who is responsible for quality improvement? The data (n=209) indicated that 25% of the
respondents had a full-time, designated quality improvement coordinator and approximately 35% had an equivalent part-time position. In the two-year colleges, 57% reported that either a full- or part-time designated quality improvement coordinator was employed; and at the four-year institutions, there was an increase of 3% in this figure.

More than 40% of the respondents reported that they did not have a designated quality improvement coordinator and indicated the position title of the person who is responsible for quality improvement. This information is presented in Table 4.

Table 4

<table>
<thead>
<tr>
<th>Position Title</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>President or Executive Council</td>
<td>7</td>
<td>8.3</td>
</tr>
<tr>
<td>Upper Level Administrator</td>
<td>38</td>
<td>45.2</td>
</tr>
<tr>
<td>Director of Human Relations</td>
<td>8</td>
<td>9.5</td>
</tr>
<tr>
<td>Quality Council</td>
<td>15</td>
<td>17.9</td>
</tr>
<tr>
<td>No one</td>
<td>2</td>
<td>2.4</td>
</tr>
<tr>
<td>Other</td>
<td>14</td>
<td>16.7</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>84</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Where there is no designated quality coordinator or director, it is apparent that the upper level administration of the college becomes directly responsible for the implementation of quality improvement practices. Interestingly, almost 18% of the respondents reported that this effort is entrusted
to and guided by a quality council or leadership team. Those position titles described as **other** included such entries as college development, development committee, director of industrial effectiveness, staff development director, shared, and **every administrator**.

**Profile of Quality Training Participants and Processes**

The implementation characteristics that describe which personnel are trained, at what levels, whether training is voluntary, when training takes place, and whether the training function is evaluated were included in this study to provide a profile of the participants in quality training as well as the training process at the responding two- and four-year colleges. These characteristics or variables are considered to be associated with perceived effectiveness, and several items on the survey instrument were designed to provide pertinent data.

**Participation in CQI Training**

Research question two asked: To what degree is participation in quality improvement training programs voluntary? **Item 19** on the survey instrument was designed to determine if training was mandatory for all employees and to further determine that if it was not mandatory, what percentage of employees attended the training voluntarily. The data collected from the 201 responses to the first part of this question indicate that at 43 or 21% of the colleges, training is mandatory for all employees. Of the 158 or 79% of the respondents indicating that quality improvement training was not a requirement, more than half noted that their employees had attended the program voluntarily.
Training of Various Personnel Levels in CQI

The third research question asked: To what extent have various levels of personnel in the college received training in continuous quality improvement practices? Item 7 of the questionnaire was designed to provide information about the percentage of selected employee groups that had received training at the time the survey was completed. A summary of the means and standard errors for each employee group is presented in Table 5. The mean numbers represent the average of percentages noted by respondents as the level of involvement in CQI training by various employee groups. Respondents were able to select a percentage from a scale of 0% to 100%.

Table 5

Mean Percentages and Standard Error Percentages for Selected Employee Groups Receiving CQI Training at Selected Colleges

<table>
<thead>
<tr>
<th>Employee Level</th>
<th>Mean of % Trained</th>
<th>Std. Error of % Trained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board Members* (n=169)</td>
<td>26.39</td>
<td>2.8995</td>
</tr>
<tr>
<td>Administrators (n=197)</td>
<td>67.82</td>
<td>2.5525</td>
</tr>
<tr>
<td>Directors/Chairs (n=192)</td>
<td>50.94</td>
<td>2.8431</td>
</tr>
<tr>
<td>Supervisors (n=189)</td>
<td>56.77</td>
<td>2.5350</td>
</tr>
<tr>
<td>Faculty (n=188)</td>
<td>32.77</td>
<td>2.3861</td>
</tr>
<tr>
<td>Professional Staff (n=192)</td>
<td>48.49</td>
<td>2.4047</td>
</tr>
<tr>
<td>Hourly Employees (n=193)</td>
<td>41.97</td>
<td>2.4808</td>
</tr>
</tbody>
</table>

Note: For the purpose of this study, board members* are considered to be an equivalent employee level.

The employee group identified as board members had the lowest number of persons involved in the training process, with respondents indicating
that 55% percent of the board members having had no training in CQI whatsoever. At the other end of the range, 12.4% of the respondents reported that 100% of their board members had received training. Administrators (persons who manage total work units of functional staffs at top levels) who participated in CQI training averaged well over 50%, with almost 40% of the respondents indicating that 100% of the administrator group had been trained. In the director/chair category (persons who manage full-time and adjunct faculty), 24% of the respondents indicated that 100% had been trained from this group. More than 50% of supervisors (persons who manage staff) had participated in training; however, only 22% of the respondents indicated that 100% of this employee group had received training. Faculty were reported as having the next least involvement in training after board members. Only 6% of the respondents indicated that 100% of the faculty had participated in CQI training at their institutions. Professional staff members appeared to be less involved in the training process also, with 11% of the respondents indicating that 100% of this employee group had participated in training. Lastly, the employee group labeled as hourly employees were less likely to have been involved in CQI training. Only 8% of the respondents indicated that all persons in this employee group had been trained at their institution.

The means for each of these groups indicate that a higher percentage of top level employees at the responding colleges (other than board members) received training as compared to lower level employee groups as well as compared to the faculty group. Overall findings indicate a relatively fair amount
of the employee populations being trained at all levels of the respondent higher education institutions.

**Delivery of CQI Training**

Research question four focused on the delivery of CQI training and asked: How is quality improvement training scheduled—as one continuous session or at periodic intervals with employees returning back to the job between sessions? Item 20 on the survey instrument provided the data to answer this question which is summarized in Table 6.

**Table 6**

<table>
<thead>
<tr>
<th>Type of Session</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous</td>
<td>23</td>
<td>11.3</td>
</tr>
<tr>
<td>Periodic</td>
<td>106</td>
<td>52.0</td>
</tr>
<tr>
<td>Both Continuous and Periodic</td>
<td>51</td>
<td>25.0</td>
</tr>
<tr>
<td>Just-in-Time Training</td>
<td>24</td>
<td>11.8</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>204</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

More than 50% of the respondents indicated that quality improvement training is delivered predominantly at periodic intervals. Another 25% indicated that a combination of the two types of sessions is used. The concept of just-in-time training was the least popular type of delivery system with 11.8% of the colleges denoting usage.
Measurement of Perceived Training Program Effectiveness

Information was gathered to determine a measurement for perceived effectiveness of quality improvement training programs at the two- and four-year colleges under investigation. Five of the items on the survey instrument, therefore, concerned the evaluation of quality improvement training efforts and the perceived outcomes as a result of such training.

Evaluation Assessment by CQI Training Participants

Research question five asked: To what extent have training participants taken part in any evaluation assessment of quality improvement training? Item 18 of the questionnaire was designed to ask the respondent to report the percentage of those trained in quality improvement processes who had taken part in any type of evaluation assessment. Of the total responses (n=200), 36% indicated that they were currently in the process of assessing the quality improvement training function at their respective institutions. Of the remaining responses, 74% indicated that more than half of those persons trained had evaluated the quality improvement training program. In fact, 34% of the respondents indicated that all of their trainees had an opportunity to evaluate the quality training program in which they had participated.

Methods of Quality Training Program Evaluation and Outcomes

To answer the sixth research question, “To what extent has quality improvement training been evaluated by various assessment methods?,” four of the questionnaire items required the respondents to indicate how they evaluated their quality training efforts and for the perceived evaluation results.
These items were based on the four levels of training program evaluation proposed by Kirkpatrick (1975) which include: (a) participant reaction to training, (b) actual learning, (c) behavior change, and (d) organizational change results. The four items (4, 5, 6, and 8) in the survey instrument relating to training effectiveness, asked whether the quality improvement training program had been evaluated by each of these approaches and what the results or perceived levels of effectiveness had been. Table 7 includes the data on the use of each of these four levels of training program evaluation as measures of effectiveness at both the two- and four-year colleges.

Table 7
Use of the Four Levels of Evaluation for CQI Training Programs at Selected Colleges (n = 211)

<table>
<thead>
<tr>
<th>Level of Evaluation</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seek Participant Reaction to Training</td>
<td>156</td>
<td>73.9</td>
</tr>
<tr>
<td>Assess Actual Learning</td>
<td>86</td>
<td>40.8</td>
</tr>
<tr>
<td>Assess Behavior Change</td>
<td>54</td>
<td>25.6</td>
</tr>
<tr>
<td>Assess Organizational Change</td>
<td>75</td>
<td>35.6</td>
</tr>
</tbody>
</table>

It is readily apparent that a majority of the respondent colleges evaluate their quality training function at what is considered to be the lowest level of evaluation—participant reaction to training (Kirkpatrick, 1975). More colleges reported assessment of organizational change than the assessment of individual behavior change.

For each of the identified measures of effectiveness, respondents were also asked to indicate ratings at each of the four levels of evaluation. For
participant reaction, a rating of the participants' overall opinion of the program was obtained. For assessment of new skills learned as a result of training, a rating for the extent of skills learned was obtained. In addition, the respondent was asked if pre- and post-testing was used to assess behavior or attitude change before and after training. For assessment of new skills being used on the job, a rating for the extent of skills used on the job was obtained, and a follow-up question was included to determine how the employee behavior change was evaluated. Finally, a rating for the fourth level of evaluation, organizational change, was obtained for those respondents indicating that they had determined whether or not positive organizational change had occurred as a result of the training. This question also included an opportunity for the respondent to categorize the degree of change in specific areas of the organization—e.g., leadership, work environment, work processes, customer service, classroom environment.

For each of these questions, respondents reported the performance of their institution's quality improvement training programs based on the identified levels of effectiveness using Likert-type scales with a range from one to ten. A summary of the mean, standard error, and response range for each measure of program effectiveness is presented in Table 8.
Table 8

Means, Standard Errors, and Response Ranges for Outcome Measures of Effectiveness of CQI Training at Selected Colleges

<table>
<thead>
<tr>
<th>Type of Evaluation</th>
<th>Mean</th>
<th>Standard Error</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant’s Reaction (n=156)</td>
<td>7.31</td>
<td>0.1252</td>
<td>3.0-10.0</td>
</tr>
<tr>
<td>(1=Unfavorable, 5=Favorable, 10=Highly Favorable)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Skills Learned (n=86)</td>
<td>6.73</td>
<td>0.1765</td>
<td>4.0-10.0</td>
</tr>
<tr>
<td>(1=No new skills, 5=Some new skills, 10=Many new skills)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Skills Used (n=54)</td>
<td>6.19</td>
<td>0.2336</td>
<td>3.0-10.0</td>
</tr>
<tr>
<td>(1=Not using skills, 10=Extensively using skills)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational Change (n=75)</td>
<td>6.07</td>
<td>0.2117</td>
<td>1.0-10.0</td>
</tr>
<tr>
<td>(1=No noticeable change, 5=Some change, 10=Extensive change)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Overall it appears that the respondents perceived the training function positively for each of the four levels of effectiveness (with 5.5 being an average rating using a Likert-type scale). The evaluation of organizational change had the greatest range which was 9 and had more responses than the third level of evaluation—new skills learned. With respect to the assessment of the extent that new skills had been learned, 20.6% of the respondents indicated that pre- and post-testing was used to assess behavior/attitude change before and after training; 61.8% indicated that no testing had been conducted; and 17.6% noted...
that their institution was in the process of adding pre- and post-test assessment to the training function.

In relation to assessing the extent that new skills were being used on the job, respondents were asked to identify the way in which employee behavior change was evaluated. Table 9 consolidates these responses into essentially five methods of behavior change assessment which include behavior change and observed activities, performance evaluations, surveys, interviews and direct observation, and customer satisfaction. While many alternatives were noted on the questionnaires, the summary in Table 9 describes the techniques most frequently used to determine employee behavior change.

Table 9

How Behavior Change is Evaluated after CQI Training at Selected Colleges (n =54)

<table>
<thead>
<tr>
<th>Type of Evaluation</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavior/Activities</td>
<td>25</td>
<td>46.3</td>
</tr>
<tr>
<td>Performance Evaluations</td>
<td>20</td>
<td>37.0</td>
</tr>
<tr>
<td>Surveys</td>
<td>18</td>
<td>33.3</td>
</tr>
<tr>
<td>Interviews/Observation</td>
<td>8</td>
<td>14.8</td>
</tr>
<tr>
<td>Customer Satisfaction</td>
<td>6</td>
<td>11.1</td>
</tr>
</tbody>
</table>

An analysis of the data indicate that respondents were inclined to use more than one type of evaluation to assess behavior change. However, only 26% of the respondents indicated that they utilize this level of evaluation.

With respect to the question about organizational change, respondents were asked to further evaluate the effectiveness of their quality training
programs based on improvement in specific areas of organizational
development such as leadership, work environment, work processes, customer
service, and classroom environment. These items were rated on a Likert-type
scale which ranged from got worse to improved. Table 10 depicts the
consensus of the specific evaluation ratings given by respondents to the series
of items pertaining to the evaluation of perceived effectiveness based on the
organizational measures.

Table 10

<table>
<thead>
<tr>
<th>Area of Organization</th>
<th>Got Worse</th>
<th>Remained the Same</th>
<th>Improved</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership</td>
<td>2</td>
<td>28</td>
<td>110</td>
<td>3</td>
</tr>
<tr>
<td>Work Environment</td>
<td>2</td>
<td>39</td>
<td>98</td>
<td>4</td>
</tr>
<tr>
<td>Work Processes</td>
<td>0</td>
<td>25</td>
<td>115</td>
<td>3</td>
</tr>
<tr>
<td>Customer Service</td>
<td>0</td>
<td>24</td>
<td>117</td>
<td>2</td>
</tr>
<tr>
<td>Classroom Environment</td>
<td>0</td>
<td>71</td>
<td>48</td>
<td>24</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>1</td>
<td>8</td>
<td>4</td>
</tr>
</tbody>
</table>

Overall, it appears that the respondents perceived improvement in all of
the selected areas of their respective institutions, with the area of classroom
environment having the least perceived improvement. In the space labeled as
other, respondents wrote in such items as assessment, pockets of excellence,
morale, student outcomes, and customer satisfaction.

Another set of variables were offered for evaluation by respondents and
focused on additional measures of CQI effectiveness pertaining to selected
work processes which included the cost of quality, time on task, waste, and service problems. These processes were considered to be relevant for certain administrative and support service areas of two- and four-year colleges, and the items were evaluated on a Likert-type scale which ranged from decreased (denoting improvement) to increased (denoting regression). This data is summarized in Table 11 which includes a frequency distribution for each of the selected work process areas.

Table 11

**Summary of Frequencies for the Evaluation of Perceived Effectiveness of Specific Work Processes after CQI Training at Selected Colleges**

<table>
<thead>
<tr>
<th>Work Process</th>
<th>Improvement</th>
<th>Remained the Same</th>
<th>Regression</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Quality</td>
<td>28</td>
<td>46</td>
<td>28</td>
<td>14</td>
</tr>
<tr>
<td>Time on Task</td>
<td>41</td>
<td>38</td>
<td>27</td>
<td>15</td>
</tr>
<tr>
<td>Waste</td>
<td>72</td>
<td>32</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Service Problems</td>
<td>79</td>
<td>30</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>

The frequency distributions for the variables in Table 11 appear to be positive as do the variables outlined in Table 10. The respondents perceived a decrease (improvement) in each of the work processes as a result of CQI training. In the area of cost of quality, there was perceived improvement as well as an equal perception of increase (regression) which is most likely related to the cost of conducting CQI training itself.
Identification of Implementation Characteristics in the Continuous Quality Improvement Training Programs

Vital to the effective implementation of continuous quality improvement is an understanding of the various quality philosophies and processes as well as training on the tools and techniques that are a critical part of quality initiatives. In addition, there are other implementation characteristics which further impact the perceived effectiveness of training programs. Several of the research questions in this study addressed these issues.

Major Implementation Characteristics—Philosophy, Tools, and Content Segments

Philosophy and Tools. Research question seven asked: To what degree have specific quality philosophies or tools supported the quality improvement training efforts? This information correlates to Item 9 on the questionnaire. A summary of the frequency distributions of the use and non-use of various quality philosophies and tools is presented in Table 12 along with the corresponding percentages.
### Table 12

Summary of Selected Frequencies and Percentages of Respondent Use of CQI Philosophies and Tools at Selected Colleges (n=211)

<table>
<thead>
<tr>
<th>Philosophy or Tool</th>
<th>Colleges Using It</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conway</td>
<td></td>
<td>7</td>
<td>03.3</td>
</tr>
<tr>
<td>Crosby</td>
<td></td>
<td>50</td>
<td>23.7</td>
</tr>
<tr>
<td>Deming</td>
<td></td>
<td>153</td>
<td>72.5</td>
</tr>
<tr>
<td>Feigenbaum</td>
<td></td>
<td>10</td>
<td>04.7</td>
</tr>
<tr>
<td>Teaming</td>
<td></td>
<td>107</td>
<td>50.7</td>
</tr>
<tr>
<td>Ishikawa</td>
<td></td>
<td>31</td>
<td>14.7</td>
</tr>
<tr>
<td>Juran</td>
<td></td>
<td>40</td>
<td>19.0</td>
</tr>
<tr>
<td>Peters</td>
<td></td>
<td>60</td>
<td>28.4</td>
</tr>
<tr>
<td>Peter Senge</td>
<td></td>
<td>47</td>
<td>22.3</td>
</tr>
<tr>
<td>Baldrige Criteria</td>
<td></td>
<td>73</td>
<td>34.6</td>
</tr>
<tr>
<td>None Specifically</td>
<td></td>
<td>85</td>
<td>40.3</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>31</td>
<td>14.7</td>
</tr>
</tbody>
</table>

Based on the information in Table 12, a wide variety of philosophies and tools appear to help fashion the training program design at the respondent colleges. The range of responses indicate a low of 3% for Conway to a high of 72% of the respondents utilizing a Deming approach. Interestingly, more than half of the respondents indicated that they had adopted a philosophy espoused by one of the more popular gurus of quality processes: Crosby, Juran, and Peters. The Baldrige Criteria also ranked high with almost 35% indicating usage. More than half of the respondents also answered that they use a teaming approach as a quality tool. In the other category, respondents offered a multiplicity of authors, companies, and philosophies which include Margaret...
Wheatly, Joel Barker, Motorola, John Gardner, Steven Covey, Stanley Spanbauer, Tom Angelo, tools training, organizational change, classroom assessment, institutional effectiveness criteria, as well as The Holy Bible. Lastly, in the category labeled none specifically, there were 85 responses or approximately 40% of the colleges affirming that they may use more than one of the philosophies or tools and even in some cases develop their own processes based on a more eclectic approach.

Content Segments. Research question eight asked: To what extent have specific content segments been used as part of the quality improvement training process? This information correlates to Item 10 on the questionnaire which asked the respondent to indicate as many content areas that were being used for quality training at their college. Questionnaire items included as content segments focused on CQI awareness, leadership, management, problem solving, teaming, process improvement, and customer service. This information is presented in Table 13 in the form of frequency distributions and percentages.
Table 13

Summary of Selected Frequencies and Percentages of Respondent Use of Specific Content Segments for CQI Training at Selected Colleges (n=211)

<table>
<thead>
<tr>
<th>Content Segment</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Awareness</td>
<td>173</td>
<td>82.0</td>
</tr>
<tr>
<td>Management Practices/Leadership</td>
<td>142</td>
<td>67.3</td>
</tr>
<tr>
<td>Interpersonal Skills</td>
<td>134</td>
<td>63.5</td>
</tr>
<tr>
<td>Processes and Improvement</td>
<td>161</td>
<td>76.3</td>
</tr>
<tr>
<td>Problem Solving Tools</td>
<td>170</td>
<td>80.6</td>
</tr>
<tr>
<td>Advanced Statistical Tools</td>
<td>21</td>
<td>10.0</td>
</tr>
<tr>
<td>Customer Service</td>
<td>149</td>
<td>70.6</td>
</tr>
<tr>
<td>Inventory Management</td>
<td>15</td>
<td>7.1</td>
</tr>
<tr>
<td>Group Dynamics</td>
<td>101</td>
<td>47.9</td>
</tr>
<tr>
<td>Team Leader Training</td>
<td>133</td>
<td>63.0</td>
</tr>
<tr>
<td>Process Improvement Teaming</td>
<td>145</td>
<td>68.7</td>
</tr>
<tr>
<td>Quality Function Deployment</td>
<td>23</td>
<td>10.9</td>
</tr>
<tr>
<td>Assessment/Measurement of CQI</td>
<td>87</td>
<td>41.2</td>
</tr>
<tr>
<td>None of the Above</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Others</td>
<td>10</td>
<td>4.7</td>
</tr>
</tbody>
</table>

The content segments identified as being used by the respondents were varied and ranged from a low of 7% for inventory/supplier training to a high of 82% for quality awareness training. Other areas which emerged as being the more popular content segments with a 50% or greater response included: problem solving tools, process improvement techniques and teaming, customer service, team leader training, interpersonal skills, and management/leadership training. Notably, there were no entries for the category of none of the above; however, for the category labeled others, there were several items written in which included effective meeting skills, focus group training, benchmarking,
strategic planning, classroom assessment, visioning, and creativity and breakthrough thinking skills.

Additional Implementation Characteristics

The next seven research questions focused on other implementation characteristics or variables associated with continuous quality improvement training programs. These variables included the degree of top management support for training, the association of training and use of skills to performance, the use of external and internal consultants and their correlation to perceived effectiveness, the extent that managers are involved in the training process, the use of pilot projects, funding allocated for the training process, and the correlation of funding to perceived effectiveness.

Top Management Support. Research question nine asked: To what degree has the institution’s top management supported the quality improvement training program? Item 11 on the questionnaire broadened the question to include perceived support for four personnel areas: (1) CEO—chancellor or president; (2) administrators—provost, vice president, dean, or chair; (3) faculty; and (4) staff. For the purposes of this study, top management is considered to be either the chief executive officer or an upper-level administrator. The data means and standard errors are presented in Table 14.
Table 14

Means and Standard Errors for Degree of Support for CQI Training at Selected Colleges

<table>
<thead>
<tr>
<th>Type of Employee</th>
<th>Mean</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chancellor, President</td>
<td>7.56</td>
<td>0.1927</td>
</tr>
<tr>
<td>Administrators</td>
<td>7.23</td>
<td>0.1661</td>
</tr>
<tr>
<td>Faculty</td>
<td>4.43</td>
<td>0.1611</td>
</tr>
<tr>
<td>Staff</td>
<td>6.52</td>
<td>0.1428</td>
</tr>
</tbody>
</table>

Rating: (1=Low Support, 5=Moderate Support, 10=High Support)

Based on the responses to this question, it appears that both the chief executive officers and other administrators support the quality training initiatives at their respective institutions with a rating level indicating moderate support to high support. It also appears that staff members show a little more than moderate support for the program. Faculty support for CQI training was at a considerably lower level.

Participation in training and use of new skills in performance reviews.

Research question ten asked: To what extent is participation in quality improvement training and the use of new skills on the job made a part of performance reviews? Items 12 and 13 on the survey instrument captured this information which is presented in Table 15 as frequencies and percentages.
Table 15

Frequency Distributions and Percentages for Participation in Quality Improvement Training and Using Skills Learned on the Job as Part of Employee Performance Reviews at Selected Colleges

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes</th>
<th>No</th>
<th>Sometimes</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attending quality improvement training is part of performance review</td>
<td>17</td>
<td>159</td>
<td>32</td>
<td>208</td>
</tr>
<tr>
<td></td>
<td>8.2%</td>
<td>76.4%</td>
<td>15.4%</td>
<td>100%</td>
</tr>
<tr>
<td>Using the skills taught on the job is part of performance review</td>
<td>26</td>
<td>135</td>
<td>44</td>
<td>205</td>
</tr>
<tr>
<td></td>
<td>12.7%</td>
<td>65.8%</td>
<td>21.5%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Note. *Frequency, percentage

Based on the data presented in Table 15, it does not appear that employee attendance in the quality training program or using the skills taught on the job is considered to be important to the performance review process at the responding colleges.

Use of consultants versus internal staff and perceived effectiveness.

Research question eleven asked: To what extent do institutions utilize external consultants versus their own internal staff as trainers in the quality improvement training program, and is there a difference in the perceived effectiveness of the training provided by each? Items 14 and 15 on the questionnaire provided the data for this research question. Of the 209 responses to the first part of the question (Item 14), 31% indicated that they use only internal staff for training purposes. Those colleges using both internal staff and outside consultants
accounted for 64% of the responses. The remaining 5% of respondents indicated that they use all external consultants in the training function. The second part of the question, dealing with perceived effectiveness for in-house training versus external consultant training, was rated on a Likert-type scale described as 1 = not effective, 5 = effective, and 10 = very effective. For the internal rating, respondents (n=172) perceived training to be considerably effective, with a mean of 7.42 and a standard error of 0.1419. Those rating the external consultants (n=154) perceived such training to be somewhat less effective, but still above the effective rating, with a mean of 6.80 and a standard error of 0.1675.

**Extent of involvement of managers or supervisors in instruction.**
Research question twelve asked: To what extent are managers involved in the instruction of the quality improvement training process? Item 16 provided the data for this research question, and a Likert-type scale was used that was described as 1 = no involvement, 5 = some involvement, and 10 = significant involvement. The data summarized from the 205 respondents indicates that there is some involvement of managers and supervisors in the instruction for the training program, with a mean of 4.9 and a standard error of 0.1729.

**Use of pilot projects.** Research question thirteen asked: To what extent are pilot projects used and appropriate groups trained for continuous quality improvement? Item 17 on the questionnaire elicited this information; and if the response was in the affirmative, the respondent was requested to identify which work units of the institution had participated in the pilot projects. Of the 203
responses, over 60% of the respondents indicated that their institution had conducted a pilot project. Table 16 summarizes, in frequencies and percentages, the work units in which pilot programs were initiated at the respondent colleges.

Table 16

<table>
<thead>
<tr>
<th>Work Unit</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>75</td>
<td>61.0</td>
</tr>
<tr>
<td>Academic Program</td>
<td>17</td>
<td>13.8</td>
</tr>
<tr>
<td>Technical Program</td>
<td>7</td>
<td>5.7</td>
</tr>
<tr>
<td>Business Office</td>
<td>42</td>
<td>34.2</td>
</tr>
<tr>
<td>Student Services</td>
<td>35</td>
<td>28.5</td>
</tr>
<tr>
<td>Library</td>
<td>11</td>
<td>8.9</td>
</tr>
<tr>
<td>Physical Plant</td>
<td>22</td>
<td>17.9</td>
</tr>
<tr>
<td>Food Services</td>
<td>7</td>
<td>5.7</td>
</tr>
<tr>
<td>Other</td>
<td>22</td>
<td>17.9</td>
</tr>
</tbody>
</table>

The dominant areas for initiating pilot programs at the respondent colleges appears to be in the administrative and support service departments. Instructional areas were the least likely to initiate such projects. In the other category, several respondents indicated that they had initiated cross-functional groups as pilot projects. Accreditation teams were also noted as pilot projects for the implementation of quality processes.

Annual budgets for CQI training. Research question fourteen asked: To what extent do two- and four-year colleges allocate funding for the quality
improvement training process? Table 17 summarizes this information for both the two- and four-year colleges.

Table 17

Estimated Annual Budgets for Quality Improvement Training at Two- and Four-Year Colleges

<table>
<thead>
<tr>
<th>Class</th>
<th>Estimated Annual Budget</th>
<th>Two-Year Colleges % (n=81)</th>
<th>Four-Year Colleges % (n=117)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No Funding</td>
<td>2.5</td>
<td>11.1</td>
</tr>
<tr>
<td>2</td>
<td>$1 to $9,999</td>
<td>33.3</td>
<td>28.2</td>
</tr>
<tr>
<td>3</td>
<td>$10,000 to $29,999</td>
<td>23.5</td>
<td>15.4</td>
</tr>
<tr>
<td>4</td>
<td>$30,000 to $49,999</td>
<td>18.5</td>
<td>12.0</td>
</tr>
<tr>
<td>5</td>
<td>$50,000 to $69,999</td>
<td>4.9</td>
<td>8.5</td>
</tr>
<tr>
<td>6</td>
<td>$70,000 to $99,999</td>
<td>4.9</td>
<td>1.7</td>
</tr>
<tr>
<td>7</td>
<td>$100,000 to $299,999</td>
<td>6.2</td>
<td>10.3</td>
</tr>
<tr>
<td>8</td>
<td>Over $300,000</td>
<td>0.0</td>
<td>2.6</td>
</tr>
<tr>
<td>9</td>
<td>Unknown</td>
<td>6.2</td>
<td>10.3</td>
</tr>
<tr>
<td></td>
<td>Totals</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

More than 55% of both the two- and four-year colleges indicated that they budget up to $50,000 on quality training. The two-year colleges had a class mean of 3.67 with a standard error of 0.2243; and the four-year colleges had a class mean of 3.99 with a standard error of 0.2337. At the four-year schools, there were thirteen respondents who reported a zero dollar budget to carry on the quality training function. While the distribution of dollars is different, the total spending for quality improvement training appears to be about the same for
two- and four-year colleges. However, data was not available to determine what impact the size of the institution would have in this comparison.

**Allocation of funding and perceived effectiveness of training.** Research question fifteen asked: To what extent does the allocation of funding for training in continuous quality improvement influence the perceived effectiveness of training? A Spearman ranked, non-parametric correlation coefficient matrix was compiled to examine the relationships between the budget allocation responses and the four outcome variables designed to measure effectiveness. None of the paired items in the matrix revealed any associations at the .05 level of significance.

**Relationships Between Major Implementation Characteristics**

Research question sixteen asked: To what extent do relationships exist between the major implementation characteristics or training program variables associated with continuous quality improvement training programs? The relationships between the major implementation characteristics or program training variables was determined through the execution of a series of Spearman ranked, non-parametric correlation coefficient matrices. These correlations were conducted for two sets of comparisons.

The first correlation was between Item 8 (c,d) and Item 9, on the questionnaire which included the implementation characteristics based on specific areas of organizational development such as leadership, work environment, work processes, and customer service, versus the types of philosophies and/or tools utilized to support training efforts. The second
correlation paired Item 8 (c,d) again with Item 10 which included the specific content segments for quality improvement training.

Tables 18a and 18b display the relationships between the various philosophical approaches and tools taught in the training program and the variables associated with the specific areas of organizational development which have been previously cited.

Table 18a

**Correlation Matrix of Major Implementation Variables Featuring Philosophy and Tools and Areas of Organizational Development**

<table>
<thead>
<tr>
<th></th>
<th>Leadership (n=143)</th>
<th>Work Environment (n=140)</th>
<th>Work Processes (n=143)</th>
<th>Customer Service (n=145)</th>
<th>Classroom Environment (n=138)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conway</td>
<td>- .0466</td>
<td>.0656</td>
<td>.0878</td>
<td>.0785</td>
<td>-.0552</td>
</tr>
<tr>
<td>Crosby</td>
<td>.0287</td>
<td>.0736</td>
<td>.1301</td>
<td>.0999</td>
<td>.0561</td>
</tr>
<tr>
<td>Deming</td>
<td>.0039</td>
<td>-.0153</td>
<td>.0537</td>
<td>.0994</td>
<td>.1413</td>
</tr>
<tr>
<td>Feigenbaum</td>
<td>.1037</td>
<td>.1962</td>
<td>.1600</td>
<td>.1499</td>
<td>.0921</td>
</tr>
<tr>
<td>Teaming</td>
<td>.0208</td>
<td>-.0900</td>
<td>-.0094</td>
<td>.0804</td>
<td>.0978</td>
</tr>
<tr>
<td>Ishikawa</td>
<td>.1503</td>
<td>.0872</td>
<td>.0298</td>
<td>.0932</td>
<td>.1547</td>
</tr>
<tr>
<td>Juran</td>
<td>.0220</td>
<td>-.0195</td>
<td>.0489</td>
<td>-.0875</td>
<td>.1803</td>
</tr>
<tr>
<td>Peters</td>
<td>.1235</td>
<td>.0142</td>
<td>-.0462</td>
<td>.0859</td>
<td>.1289</td>
</tr>
<tr>
<td>Peter Senge</td>
<td>.2159*</td>
<td>.0583</td>
<td>-.0126</td>
<td>-.0418</td>
<td>.0920</td>
</tr>
<tr>
<td>Baldrige</td>
<td>.2413*</td>
<td>.0304</td>
<td>.0658</td>
<td>.0367</td>
<td>-.0008</td>
</tr>
</tbody>
</table>

*p ≤ .05
When reviewing the various philosophies as depicted in Table 18a, two statistically significant relationships emerge. Both Senge and the Baldrige Criteria are associated with the perception of improved leadership at the responding institutions ($r \geq .17, p \leq .05$). No other significant associations were noted.

Table 18b

**Correlation Matrix of Major Implementation Variables Featuring Philosophy and Tools and Areas of Organizational Development**

<table>
<thead>
<tr>
<th></th>
<th>Cost of Quality (n=114)</th>
<th>Time on Task (n=121)</th>
<th>Waste (n=121)</th>
<th>Service Problems (n=126)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conway</td>
<td>.0478</td>
<td>.1069</td>
<td>-.1179</td>
<td>-.1031</td>
</tr>
<tr>
<td>Crosby</td>
<td>-.0588</td>
<td>-.0386</td>
<td>-.2462*</td>
<td>-.1573</td>
</tr>
<tr>
<td>Deming</td>
<td>-.1179</td>
<td>.0412</td>
<td>-.0771</td>
<td>-.1069</td>
</tr>
<tr>
<td>Feigenbaum</td>
<td>-.1239</td>
<td>.1322</td>
<td>-.0619</td>
<td>-.0645</td>
</tr>
<tr>
<td>Teaming</td>
<td>-.0950</td>
<td>.0686</td>
<td>-.0291</td>
<td>-.0123</td>
</tr>
<tr>
<td>Ishikawa</td>
<td>-.1594</td>
<td>.0507</td>
<td>-.1171</td>
<td>.0077</td>
</tr>
<tr>
<td>Juran</td>
<td>-.0415</td>
<td>-.0569</td>
<td>-.0732</td>
<td>.0752</td>
</tr>
<tr>
<td>Peters</td>
<td>.0186</td>
<td>.1412</td>
<td>.0022</td>
<td>-.0329</td>
</tr>
<tr>
<td>Peter Senge</td>
<td>-.1335</td>
<td>-.0720</td>
<td>-.0855</td>
<td>-.0570</td>
</tr>
<tr>
<td>Baldrige</td>
<td>-.1950</td>
<td>.1349</td>
<td>-.0605</td>
<td>-.1050</td>
</tr>
</tbody>
</table>

*p ≤ .05

When analyzing the data in Table 18b, which compares the philosophies and tools to perceived improvement in certain process areas, only the use of
Crosby as a philosophy is associated with the perception of a decrease in waste, which is statistically significant when $r \geq 0.19$ and $p \leq 0.05$. (When the associated correlation coefficient reflects a negative sign, it is an indicator of improvement.) No other significant associations were noted.

Relationships between the specific content segment variables and the variables associated with the specific areas of organizational development are presented in Tables 19a and 19b. The use of the Spearman ranked, non-parametric correlation coefficient reveals significant positive correlations at the $p \leq 0.05$ level of significance in several cases.

As denoted in Table 19a, quality process awareness training is positively related to perceived improvement in the effectiveness of the work environment ($r \geq 0.17$, $p \leq 0.05$). Training in management and leadership is positively related to perceived improvement in the effectiveness of leadership ($r \geq 0.17$, $p \leq 0.05$). Team leadership training is positively related to perceived improvement in the work environment ($r \geq 0.17$, $p \leq 0.05$) as well as to the classroom environment ($r \geq 0.17$, $p \leq 0.05$). Team training in process improvement is positively related to perceived improvements in both work processes and classroom environment ($r \geq 0.17$, $p \leq 0.05$).
Table 19a

**Correlation Matrix of Major Implementation Variables Featuring Content Segments**

<table>
<thead>
<tr>
<th></th>
<th>Leadership (n=143)</th>
<th>Work Environment (n=140)</th>
<th>Work Processes (n=143)</th>
<th>Customer Service (n=145)</th>
<th>Classroom Environment (n=138)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Awareness</td>
<td>.1729</td>
<td></td>
<td>.2115</td>
<td>.2045</td>
<td>.1093</td>
</tr>
<tr>
<td>Management and</td>
<td>.2429*</td>
<td>.2246*</td>
<td>.1144</td>
<td>.0278</td>
<td>.0159</td>
</tr>
<tr>
<td>Leadership</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpersonal Skills</td>
<td>-.0068</td>
<td>.1342</td>
<td>-.0140</td>
<td>.0088</td>
<td>.0651</td>
</tr>
<tr>
<td>Process Improvement</td>
<td>.1980</td>
<td>.0654</td>
<td>.1630</td>
<td>.1902</td>
<td>.1738</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>.0213</td>
<td>.0318</td>
<td>.0334</td>
<td>.0716</td>
<td>.1910</td>
</tr>
<tr>
<td>Adv. Statistical</td>
<td>-.1584</td>
<td>.0093</td>
<td>.1373</td>
<td>.0686</td>
<td>.1532</td>
</tr>
<tr>
<td>Processes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer Service</td>
<td>.1255</td>
<td>.1575</td>
<td>-.0696</td>
<td>.1035</td>
<td>.0675</td>
</tr>
<tr>
<td>Inventory Management</td>
<td>.1246</td>
<td>.0585</td>
<td>.1073</td>
<td>.0345</td>
<td>.1805</td>
</tr>
<tr>
<td>Group Dynamics</td>
<td>-.0099</td>
<td>.0801</td>
<td>.0797</td>
<td>.1331</td>
<td>.0581</td>
</tr>
<tr>
<td>Team Leadership</td>
<td>.1077</td>
<td>.2156*</td>
<td>.0831</td>
<td>-.0138</td>
<td>.3142*</td>
</tr>
<tr>
<td>Team Process</td>
<td>.1978</td>
<td>.1162</td>
<td>.2351*</td>
<td>.1258</td>
<td>.2842*</td>
</tr>
<tr>
<td>Improvement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality Function</td>
<td>.0627</td>
<td>-.0544</td>
<td>.0357</td>
<td>-.0230</td>
<td>.0116</td>
</tr>
<tr>
<td>Deployment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment of Quality</td>
<td>.1773</td>
<td>.1100</td>
<td>.1350</td>
<td>.1434</td>
<td>.0890</td>
</tr>
</tbody>
</table>

*p ≤ .05
When analyzing the data in Table 19b, which compares the content segments to perceived improvement in processes that are relevant to certain administrative and support areas, several statistically significant relationships emerge at the .05 level of significance. Both training in process improvement and problem solving are positively related to perceived improvement in controlling waste ($r \geq .18$). Team leadership training is positively related to three of the areas of perceived institutional improvements—cost of quality ($r \geq .19$), controlling waste ($r \geq .18$), and decreasing service problems ($r \geq .17$). In addition, training in team process improvement was also positively related to perceived improvement in controlling waste ($r \geq .17$).
Table 19b

**Correlation Matrix of Major Implementation Variables Featuring Content Segments**

<table>
<thead>
<tr>
<th></th>
<th>Cost of Quality (n=114)</th>
<th>Time on Task (n=121)</th>
<th>Waste (n=121)</th>
<th>Service Problems (n=126)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Awareness</td>
<td>-.1061</td>
<td>-.1149</td>
<td>-.1611</td>
<td>-.1839</td>
</tr>
<tr>
<td>Management and Leadership</td>
<td>-.1290</td>
<td>-.0463</td>
<td>-.1345</td>
<td>-.1265</td>
</tr>
<tr>
<td>Interpersonal Skills</td>
<td>-.0410</td>
<td>-.0342</td>
<td>-.1197</td>
<td>.0224</td>
</tr>
<tr>
<td>Process Improvement</td>
<td>-.0100</td>
<td>-.1190</td>
<td>-.2818*</td>
<td>-.1426</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>.0116</td>
<td>-.0839</td>
<td>-.2632*</td>
<td>-.1942</td>
</tr>
<tr>
<td>Adv. Statistical Processes</td>
<td>.0317</td>
<td>-.0275</td>
<td>-.0963</td>
<td>-.1337</td>
</tr>
<tr>
<td>Customer Service</td>
<td>-.1206</td>
<td>-.1033</td>
<td>-.1654</td>
<td>-.1924</td>
</tr>
<tr>
<td>Inventory Management</td>
<td>-.1643</td>
<td>-.0760</td>
<td>-.1557</td>
<td>-.0406</td>
</tr>
<tr>
<td>Group Dynamics</td>
<td>-.1872</td>
<td>-.1354</td>
<td>-.1673</td>
<td>-.1113</td>
</tr>
<tr>
<td>Team Leadership</td>
<td>-.3140*</td>
<td>-.1242</td>
<td>-.3266*</td>
<td>-.2919*</td>
</tr>
<tr>
<td>Team Process Improvement</td>
<td>.0659</td>
<td>-.1817</td>
<td>-.2543*</td>
<td>-.1376</td>
</tr>
<tr>
<td>Quality Function Deployment</td>
<td>.0008</td>
<td>.0179</td>
<td>.0330</td>
<td>.0145</td>
</tr>
<tr>
<td>Assessment of Quality</td>
<td>-.0812</td>
<td>-.0252</td>
<td>-.1001</td>
<td>-.1029</td>
</tr>
</tbody>
</table>

*p ≤ .05
Relationships Between Implementation Characteristics and Outcome Measures for Training Program Effectiveness

A series of Spearman ranked, non-parametric correlation coefficient matrices were compiled to examine the relationships between the implementation characteristics or training program variables and the four outcome variables designed to measure perceived training program effectiveness. This information was compiled to answer research question seventeen: To what extent are there relationships between implementation characteristics or training program variables and perceived quality training program effectiveness? Comparisons were completed for the major implementation characteristics which included the philosophies, tools, and content segments, as well as for other training program variables, in relation to the four measures of effectiveness—rated reaction/opinion, the extent of skills learned, the extent of skills used, and the extent of positive organizational change.

Quality Philosophies and Tools

The Spearman ranked, non-parametric correlation coefficient matrices for the major implementation characteristics which related to specific quality philosophies and tools and the four outcome measures of effectiveness are presented in Table 20a. When correlating the various quality philosophies and tools included in Table 20a with the four outcome measures of effectiveness, there are several associations to be noted. The outcome measure described as
participant reaction/opinion yielded one statistically significant association at the .05 level of significance with the item labeled as other ($r ≥ .16$). For the outcome measure described as extent that new skills are learned, three associations with a specific philosophy or tool appear to be statistically significant. The use of Peters and the Baldrige Criteria appear to be related at the .05 level of significance to the extent that new skills are learned ($r ≥ .22$). Neither of the remaining two outcome measures yielded statistically significant associations.

Table 20a

Correlation Matrix of Major Implementation Variables Featuring Philosophy and Tools and Outcome Measures of Training Program Effectiveness

<table>
<thead>
<tr>
<th></th>
<th>Participant Reaction/Opinion (n=156)</th>
<th>Extent of Skills Learned (n=86)</th>
<th>Extent of Skills Used (n=54)</th>
<th>Positive Organizational Change (n=75)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conway</td>
<td>.0377</td>
<td>.0827</td>
<td>.0053</td>
<td>-.0265</td>
</tr>
<tr>
<td>Crosby</td>
<td>-.0269</td>
<td>.0447</td>
<td>-.0254</td>
<td>.1336</td>
</tr>
<tr>
<td>Deming</td>
<td>-.0245</td>
<td>-.0682</td>
<td>-.0195</td>
<td>.0231</td>
</tr>
<tr>
<td>Feigenbaum</td>
<td>.0458</td>
<td>.2111</td>
<td>.0752</td>
<td>.0603</td>
</tr>
<tr>
<td>Teaming</td>
<td>-.0118</td>
<td>.0091</td>
<td>-.2145</td>
<td>.1028</td>
</tr>
<tr>
<td>Ishikawa</td>
<td>-.0427</td>
<td>.1240</td>
<td>.0797</td>
<td>-.1087</td>
</tr>
<tr>
<td>Juran</td>
<td>-.0925</td>
<td>.0785</td>
<td>.1217</td>
<td>.0020</td>
</tr>
<tr>
<td>Peters</td>
<td>.0293</td>
<td>.2414*</td>
<td>-.0652</td>
<td>.0374</td>
</tr>
<tr>
<td>Peter Senge</td>
<td>.0095</td>
<td>.0573</td>
<td>-.0390</td>
<td>.1869</td>
</tr>
<tr>
<td>Baldrige</td>
<td>.0124</td>
<td>.2394*</td>
<td>-.0036</td>
<td>.1700</td>
</tr>
<tr>
<td>Other</td>
<td>.1741*</td>
<td>.1900</td>
<td>.0290</td>
<td>.0436</td>
</tr>
</tbody>
</table>

*p ≤ .05
Content Segments

The Spearman ranked, non-parametric correlation coefficient matrix for training program content segment variables and the four outcome measures of effectiveness are presented in Table 20b. Several statistically significant associations at the .05 level of significance emerge from this correlation. For the outcome measure of participant reaction/opinion, quality awareness training appears to be related to a more positive rating of this level of effectiveness ($r > .16$). Two content segments appear to be related to the extent of skills learned. Both process improvement training and the assessment of quality also appear to have a positive impact on this measure of effectiveness ($r > .21$). For the outcome measure of extent of skills used, there were no apparent significant associations. The final level of effectiveness, positive organization change, yielded several positive associations with the content segment variables. Training in quality awareness, management and leadership, interpersonal skills, and team leadership all appear to be related to positive organizational change ($r > .22$). One negative association also emerged in this comparison. The content segment variable labeled as advanced statistical processes was inversely correlated to this outcome measure ($r > .22$), indicating a negative relationship.
Table 20b

Correlation Matrix of Major Implementation Variables Featuring Content Segments and Outcome Measures of Training Program Effectiveness

<table>
<thead>
<tr>
<th></th>
<th>Participant Reaction/Opinion (n=156)</th>
<th>Extent of Skills Learned (n=86)</th>
<th>Extent of Skills Used (n=54)</th>
<th>Positive Organizational Change (n=75)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Awareness</td>
<td>.1919*</td>
<td>.1579</td>
<td>-.0763</td>
<td>.2652*</td>
</tr>
<tr>
<td>Management and Leadership</td>
<td>-0.0255</td>
<td>0.0839</td>
<td>-0.0850</td>
<td>.3471*</td>
</tr>
<tr>
<td>Interpersonal Skills</td>
<td>-0.0899</td>
<td>-0.0924</td>
<td>0.0175</td>
<td>.2665*</td>
</tr>
<tr>
<td>Process Improvement</td>
<td>0.1114</td>
<td>0.2697*</td>
<td>0.0308</td>
<td>0.1909</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>0.0281</td>
<td>-0.0340</td>
<td>-0.1771</td>
<td>0.1823</td>
</tr>
<tr>
<td>Adv. Statistical Processes</td>
<td>.0519</td>
<td>-0.0673</td>
<td>-0.0144</td>
<td>-0.2189*</td>
</tr>
<tr>
<td>Customer Service</td>
<td>0.0375</td>
<td>0.0508</td>
<td>0.0170</td>
<td>0.1921</td>
</tr>
<tr>
<td>Inventory Management</td>
<td>-0.0203</td>
<td>0.1064</td>
<td>0.0660</td>
<td>0.1930</td>
</tr>
<tr>
<td>Group Dynamics</td>
<td>0.0618</td>
<td>0.1145</td>
<td>0.2388</td>
<td>0.1497</td>
</tr>
<tr>
<td>Team Leadership</td>
<td>-0.0343</td>
<td>0.0544</td>
<td>0.1105</td>
<td>0.3994*</td>
</tr>
<tr>
<td>Team Process Improvement</td>
<td>-0.0522</td>
<td>0.0751</td>
<td>0.1263</td>
<td>0.0342</td>
</tr>
<tr>
<td>Quality Function Deployment</td>
<td>-0.0648</td>
<td>0.0874</td>
<td>0.1811</td>
<td>-0.0974</td>
</tr>
<tr>
<td>Assessment of Quality</td>
<td>0.0896</td>
<td>0.2987*</td>
<td>0.0949</td>
<td>0.1914</td>
</tr>
</tbody>
</table>

*p ≤ .05

Other Training Program Variables

To determine the relationships between other training program variables and perceived training program effectiveness, a series of Spearman ranked,
non-parametric correlation coefficient matrices were computed. Those training variables which related to specific outcome measures at the \( p \leq .05 \) level of significance are included in tables 21a, 21b, 21c, and 21d, which are categorized by the four levels of effectiveness—rated reaction/opinion, the extent of new skills learned, the extent of new skills used, and the extent of positive organizational change.

**Correlations with Rated Reaction/Opinion.** Table 21a lists three training program variables that correlated with the outcome measure of rated reaction/opinion of the training program at the .05 level of significance. The rated effectiveness of internal trainers appears to have a stronger relationship to the outcome measure of rated reaction/opinion than does the rated effectiveness of external trainers.

**Table 21a**

**Training Variables that Correlate to Explain the Outcome Measure of Rated Reaction/Opinion**

<table>
<thead>
<tr>
<th>Reaction/Opinion to the Training Program</th>
<th>( r_s^* )</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent of Staff Support of Training</td>
<td>.3316</td>
<td>155</td>
</tr>
<tr>
<td>Rated Effectiveness of Internal Trainers</td>
<td>.4228</td>
<td>136</td>
</tr>
<tr>
<td>Rated Effectiveness of External Trainers</td>
<td>.2813</td>
<td>123</td>
</tr>
</tbody>
</table>

\( ^* p \leq .05 \)
Correlations with Extent of New Skills Learned. Table 21b lists five training program variables that correlated with the outcome measure of extent of new skills learned at the .05 level of significance. Both faculty and staff support of the training program were associated with this outcome measure, with staff support appearing to have a somewhat stronger association. The extent of the use of external or internal trainers had an inverse correlation to this outcome measure, indicating a negative relationship. The rated effectiveness of both the internal and external trainers were positively related to the extent of new skills learned, with rated effectiveness of internal trainers appearing to have a much stronger association.

Table 21b

Training Variables that Correlate to Explain the Outcome Measure of Extent of New Skills Learned

<table>
<thead>
<tr>
<th>Extent of New Skills Learned</th>
<th>r*</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent of Faculty Support of Training</td>
<td>.2204</td>
<td>8</td>
</tr>
<tr>
<td>Extent of Staff Support of Training</td>
<td>.3897</td>
<td>85</td>
</tr>
<tr>
<td>Extent of Use of External or Internal Trainers</td>
<td>-.2127</td>
<td>86</td>
</tr>
<tr>
<td>Rated Effectiveness of Internal Trainers</td>
<td>.4035</td>
<td>73</td>
</tr>
<tr>
<td>Rated Effectiveness of External Trainers</td>
<td>.2583</td>
<td>67</td>
</tr>
</tbody>
</table>

*p ≤ .05

Correlations with the Extent of New Skills Used. Table 21c lists four statistically significant variables that correlated with the outcome measure of
extent of new skills used at the .05 level of significance. The extent of both administrator and staff support of training were associated with this outcome measure, with staff support showing a stronger relationship. The extent that skills are used as part of performance reviews was inversely correlated to this outcome measure, indicating a negative relationship. The rated effectiveness of internal training was also associated with this measure of effectiveness.

Table 21c

Training Variables that Correlate to Explain the Outcome Measure of Extent of New Skills Used

<table>
<thead>
<tr>
<th>Extent of New Skills Used</th>
<th>$r_s^*$</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent of Administrator Support of Training</td>
<td>.2730</td>
<td>35</td>
</tr>
<tr>
<td>Extent of Staff Support of Training</td>
<td>.4102</td>
<td>55</td>
</tr>
<tr>
<td>Extent Skills Used are Part of Performance Review</td>
<td>-.3967</td>
<td>53</td>
</tr>
<tr>
<td>Rated Effectiveness of Internal Trainers</td>
<td>.3066</td>
<td>53</td>
</tr>
</tbody>
</table>

*p ≤ .05

Correlations with the Extent of Positive Organizational Change. Table 21d lists fourteen statistically significant variables that correlated with the outcome measure of extent of positive organizational change at the .05 level of significance. With the exception of the category identified as chairs/directors on the survey instrument, the extent that all of the other groups of employees were trained (board members, administrators, supervisors, faculty, professional staff, and support staff) emerged as statistically significant at the .05 level of
significance in their association with the outcome measure of positive organizational change. The extent that supervisors are trained had the strongest relationship for this item. In the area of support for the training program, all employee groups showed a statistically significant relationship to the outcome measure of the extent of positive organizational change, with the faculty group showing the strongest association. The rated effectiveness of both the internal and external trainers were positively related to the extent of new skills learned, with external trainers appearing to have a stronger association for this outcome measure. The final variable which emerged as statistically significant in this correlation was the extent that supervisors/managers are involved in the instructional process.
Table 21d

Training Variables that Correlate to Explain the Outcome Measure of Extent of Positive Organizational Change

<table>
<thead>
<tr>
<th>Extent of Positive Organizational Change</th>
<th>$r_s^*$</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent that Board Members are Trained</td>
<td>.3389</td>
<td>61</td>
</tr>
<tr>
<td>Extent that Administrators are Trained</td>
<td>.2652</td>
<td>72</td>
</tr>
<tr>
<td>Extent that Supervisors are Trained</td>
<td>.4417</td>
<td>71</td>
</tr>
<tr>
<td>Extent that Faculty are Trained</td>
<td>.2909</td>
<td>69</td>
</tr>
<tr>
<td>Extent that Professional Staff are Trained</td>
<td>.3488</td>
<td>74</td>
</tr>
<tr>
<td>Extent that Support Staff are Trained</td>
<td>.3677</td>
<td>74</td>
</tr>
<tr>
<td>Extent of President/Chancellor Support of Training</td>
<td>.5693</td>
<td>74</td>
</tr>
<tr>
<td>Extent of Administrator Support of Training</td>
<td>.4951</td>
<td>76</td>
</tr>
<tr>
<td>Extent of Faculty Support of Training</td>
<td>.6009</td>
<td>74</td>
</tr>
<tr>
<td>Extent of Staff Support of Training</td>
<td>.5566</td>
<td>76</td>
</tr>
<tr>
<td>Extent Skills Used are Part of Performance Review</td>
<td>-.2445</td>
<td>74</td>
</tr>
<tr>
<td>Rated Effectiveness of Internal Trainers</td>
<td>.2778</td>
<td>71</td>
</tr>
<tr>
<td>Rated Effectiveness of External Trainers</td>
<td>.3932</td>
<td>63</td>
</tr>
<tr>
<td>Extent that Supervisors/Managers are Involved in Instruction for Quality Training Program</td>
<td>.2875</td>
<td>75</td>
</tr>
</tbody>
</table>

*$p \leq .05$
Multiple Regression Analyses of Outcome Measures
of Perceived Training Program Effectiveness

In order to ascertain the relative importance of the statistically significant implementation characteristics in explaining the variation in quality training program effectiveness, a series of stepwise multiple regression analyses were executed for each of the four outcome measures of effectiveness—rated reaction/opinion, the extent of skills learned, the extent of skills used, and the extent of positive organizational change. All of the implementation variables that correlated with an outcome measure at the .05 level of significance in the Spearman ranked, non-parametric correlations were entered into each regression analysis using the stepwise method, based upon their ability to explain a significant proportion of the variance.

Philosophies/Tools and Content Segments

Tables 22 through 24 include the results of three of the regression analyses which were executed to reveal the predictor variables or major implementation characteristics relating to the philosophies, tools, and content segments included in the training program and their ability to explain the four outcome measures of effectiveness—rated reaction/opinion, extent of new skills learned, extent of new skills used, and extent of positive organizational change. The outcome measure relating to the extent of new skills used did not yield any significant variables to enter into the multiple regression analysis for this category and, therefore, could not be included.
Variables which Predict Rated Reaction/Opinion of the Training Program.

The two variables which were significant in the Spearman ranked, non-parametric correlation matrices, which included the philosophies, tools, and content segments and associated with the outcome measure of reaction/opinion, were quality awareness and other. Table 21 provides a summary of the results of the multiple regression analysis for this outcome measure.

Table 22

<table>
<thead>
<tr>
<th>Step</th>
<th>Variables in the Equation</th>
<th>R</th>
<th>ΔR</th>
<th>F</th>
<th>d.f.</th>
<th>Std. Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quality Awareness</td>
<td>.1981</td>
<td>0.0392</td>
<td>6.29</td>
<td>1, 154</td>
<td>.189</td>
</tr>
<tr>
<td>2</td>
<td>Other</td>
<td>.2526</td>
<td>0.0246</td>
<td>4.02</td>
<td>2, 153</td>
<td>.157</td>
</tr>
</tbody>
</table>

Final $R^2 = .0638$

The content segment identified as quality awareness and the category labeled as other in the philosophy/tools survey item, together explained 6% of the variance for the outcome measure of reaction/opinion of the quality improvement training program.

Variables which Predict the Extent of New Skills Learned. Table 23 includes the results of the multiple regression analysis related to the extent that new skills were learned. The data relating to the five variables which were significant in the Spearman ranked, non-parametric correlation matrices, which
included philosophy/tools and content segments, were entered into the regression analysis. These variables included Peters, Baldrige, process improvement, and assessment of quality.

Table 23

**Stepwise Multiple Regression of Significant Major Implementation Characteristics to Predict Rated Extent New Skills Learned**

<table>
<thead>
<tr>
<th>Step</th>
<th>Variables in the Equation</th>
<th>R</th>
<th>ΔR</th>
<th>F</th>
<th>d.f.</th>
<th>Std. Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Assessment of Quality</td>
<td>.2974</td>
<td>0.0885</td>
<td>8.15</td>
<td>1, 84</td>
<td>.297</td>
</tr>
</tbody>
</table>

Final $R^2 = .0885$

Of the four variables entered, only one remained in the equation to explain variance of the outcome measure identified as extent of new skills learned. The content segment variable—assessment of quality—explained almost 9% of the variance for this outcome measure.

Variables which Predict the Extent of Positive Organizational Change.

The results of the multiple regression analysis related to the outcome measure extent of positive organizational change are detailed in Table 24. The variables which were entered into the equation included the content segments that were significant in the Spearman ranked, non-parametric correlation matrix. These variables included quality awareness, management and leadership, interpersonal skills, team leadership, and advanced statistical processes which had a negative relationship.
Table 24

Stepwise Multiple Regression of Significant Major Implementation
Characteristics to Predict Rated Positive Organizational Change

<table>
<thead>
<tr>
<th>Step</th>
<th>Variables in the Equation</th>
<th>R</th>
<th>ΔR</th>
<th>F</th>
<th>d.f.</th>
<th>Std. Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Team Leadership</td>
<td>.4142</td>
<td>0.1716</td>
<td>15.12</td>
<td>1, 73</td>
<td>.376</td>
</tr>
<tr>
<td>2</td>
<td>Management and Leadership</td>
<td>.5197</td>
<td>0.0985</td>
<td>9.72</td>
<td>2, 72</td>
<td>.316</td>
</tr>
</tbody>
</table>

Final $R^2 = .2701$

Of the four variables entered into the equation, the two which remained after Step 2 were the content segment variables identified as team leadership and management and leadership. These two variables in combination explain 27% of the variance for the outcome measure of positive organizational change.

Other Training Program Variables

Tables 25 through 28 include the results of four stepwise multiple regression analyses which were executed to reveal the predictor variables relating to the other statistically significant training variables or implementation characteristics of quality training programs and their ability to explain the four outcome measures of the rated reaction/opinion, the extent of new skills learned, the extent of new skills used, and the extent of positive organizational change.

Other Significant Training Variables which Predict Rated Reaction or Opinion of the Training Program. The three training variables which were
significant in the Spearman ranked, non-parametric correlation matrices and were associated with reaction/opinion, included the extent of staff support of training, rated effectiveness of internal trainers, and rated effectiveness of external trainers. Table 25 provides a summary of the results of the stepwise multiple regression analysis for this outcome measure.

**Table 25**

*Stepwise Multiple Regression of Significant Other Training Program Variables to Predict Rated Reaction/Opinion*

<table>
<thead>
<tr>
<th>Step</th>
<th>Variables in the Equation</th>
<th>R</th>
<th>ΔR</th>
<th>F</th>
<th>d.f.</th>
<th>Std. Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rated Effectiveness of Internal Trainers</td>
<td>.3961</td>
<td>.1526</td>
<td>27.12</td>
<td>1, 118</td>
<td>.376</td>
</tr>
<tr>
<td>2</td>
<td>Rated Effectiveness of External Trainers</td>
<td>.2192</td>
<td>.0467</td>
<td>17.83</td>
<td>2, 117</td>
<td>.175</td>
</tr>
</tbody>
</table>

Final $R^2 = .1993$

Of the three significant training variables which emerged in the Spearman correlation, the two independent variables which related to the effectiveness of trainers, in combination, accounted almost 20% of the variance for the outcome measure of reaction/opinion of the quality improvement training program.

*Other Significant Training Variables which Predict the Extent of New Skills Learned.* Table 26 includes the results of the stepwise multiple regression analysis related to the extent that new skills were learned. The data relating to the five variables which were significant in the Spearman ranked, non-
parametric correlation matrices, which included other training variables, were entered into the regression analysis. These variables included the extent of faculty support of training, the extent of staff support of training, the extent of the use of external or internal trainers, the rated effectiveness of internal trainers, and the rated effectiveness of external trainers.

Table 26

Stepwise Multiple Regression of Significant Other Training Program Variables to Predict Rated Extent of New Skills Learned

<table>
<thead>
<tr>
<th>Step</th>
<th>Variables in the Equation</th>
<th>R</th>
<th>ΔR</th>
<th>F</th>
<th>d.f.</th>
<th>Std. Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rated Effectiveness of Internal Trainers</td>
<td>.3419</td>
<td>.01105</td>
<td>9.65</td>
<td>2, 60</td>
<td>.327</td>
</tr>
<tr>
<td>2</td>
<td>Extent of Faculty Support of Training</td>
<td>.2729</td>
<td>.0758</td>
<td>7.99</td>
<td>1, 61</td>
<td>.179</td>
</tr>
</tbody>
</table>

Final $R^2 = .1863$

Of the five variables entered, two remained in the equation to explain variance of the outcome measure identified as extent of new skills learned. Extent of faculty support and rated effectiveness of internal trainers together explained almost 19% of the variance.

Other Significant Training Variables which Predict the Extent of New Skills Used. Table 27 includes the results of the stepwise multiple regression analysis related to the extent that new skills were used. The data relating to the four variables which were significant in the Spearman ranked, non-parametric correlation matrices, which included other training variables, were entered into
the regression analysis. These variables included the, the extent of administrator support of training, the extent of staff support of training, the extent that skills used are part of a performance review, and the rated effectiveness of internal trainers.

Table 27

**Stepwise Multiple Regression of Significant Other Training Program Variables to Predict Rated Extent of New Skills Used**

<table>
<thead>
<tr>
<th>Step</th>
<th>Variables in the Equation</th>
<th>R</th>
<th>ΔR</th>
<th>F</th>
<th>df</th>
<th>Std. Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Rated Effectiveness of Internal Trainers</td>
<td>.3811</td>
<td>0.1396</td>
<td>8.66</td>
<td>1, 51</td>
<td>.361</td>
</tr>
</tbody>
</table>

Final $R^2 = .1396$

Of the four training variables entered, one variables remained in the equation to explain variance of the outcome measure identified as extent of new skills used. The training variable of rated effectiveness of internal training explained almost 14% of the variance for this outcome measure.

**Other Significant Training Variables which Predict the Extent of Positive Organizational Change.** Table 28 includes the results of the stepwise multiple regression analysis related to the extent of positive organizational change. The data relating to the seventeen training variables which were significant in the Spearman ranked, non-parametric correlation matrices were entered into the regression analysis. These variables included the extent that board members, administrators, supervisors, faculty, professional staff, and support staff are
trained; the extent of president/chancellor, administrator, faculty, and staff support of training; the extent that skills used are part of a performance review; the rated effectiveness of internal and external trainers, and the extent that supervisors/managers are involved in instruction for quality training programs.

Table 28

Stepwise Multiple Regression of Significant Other Training Program Variables to Predict Rated Extent of Positive Organizational Change

<table>
<thead>
<tr>
<th>Step</th>
<th>Variables in the Equation</th>
<th>.R</th>
<th>.AR</th>
<th>F</th>
<th>d.f.</th>
<th>Std. Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Extent of Staff Support of Training</td>
<td>.4570</td>
<td>.1248</td>
<td>37.69</td>
<td>1, 41</td>
<td>.384</td>
</tr>
<tr>
<td>2</td>
<td>Extent of Faculty Support of Training</td>
<td>.3405</td>
<td>.1030</td>
<td>23.45</td>
<td>2, 40</td>
<td>.236</td>
</tr>
</tbody>
</table>

Final $R^2 = .2278$

Of the fourteen variables entered, two remained in the equation to explain variance of the outcome measure identified as extent of positive organizational change. The training variables identified as extent of staff support of training and the extent of faculty support of training together explained almost 23% of the variance for this outcome measure, with staff support being somewhat greater.
Testing for the Two Hypotheses

In order to address certain research objectives, the following hypotheses were proposed:

Hypothesis 1 (Research Question 9): There will be no significant difference between administrators, faculty, and staff, at two- and four-year colleges, in their perceptions of the degree to which top management has supported continuous quality improvement training programs.

Hypothesis 2 (Research Question 18): There will be no significant difference between administrators, faculty, and staff, at two- and four-year colleges, in their perceptions of the effectiveness of continuous quality improvement training programs at their institutions.

Top Management Support of Quality Training

Hypothesis 1, which was derived from research question 9, was tested using the Hotelling $T^2$ test as a preliminary step in the multivariate process. The Hotelling $T^2$ test showed a significant overall difference (Hotelling $T^2 = 50.98$, $F = 12.56$, $p \leq .0001$) between administrators, faculty, and staff at two- and four-year colleges in their perceptions of the degree to which top management has supported continuous quality improvement training programs. This result led to rejection of the null hypothesis of identical mean vectors for the two groups at the conventional .05 or .01 levels. Since there was a significant result in the multivariate $t$ test of the two groups, further analysis was necessary to find out exactly which dependent variable(s) contributed to the overall significant
difference. Therefore, both the two- and four-year responses were compared with respect to each of the separate dependent variables using a $t$ test for independent samples. This information is summarized in Table 29.

Table 29

<table>
<thead>
<tr>
<th>Top Management Support</th>
<th>$\bar{x}_2$</th>
<th>$\bar{x}_4$</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chief Executive Officer</td>
<td>8.5422</td>
<td>6.8718</td>
<td>4.67*</td>
<td>.0001</td>
</tr>
<tr>
<td>(n=83)</td>
<td>(n=117)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administrator</td>
<td>7.4762</td>
<td>7.0593</td>
<td>1.28</td>
<td>.2038</td>
</tr>
<tr>
<td>(n=84)</td>
<td>(n=118)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* $p \leq .05$

The two-year college sample revealed a higher mean for perceived support of both the chief executive officer and the administrator groups. The chief executive officer group for the two-year colleges had a calculated $t$ of 4.67, based on a comparison of the two means, which was statistically significant ($p \leq .0001$). Therefore, the training variable of perceived top management support from the chief executive officer at the two-year colleges contributed to the overall significant difference between the two- and four-year colleges.

Effectiveness of Continuous Quality Improvement Training Programs

Hypothesis 2, which was derived from research question 18, was tested using the Hotelling $T^2$ test as a preliminary step in the multivariate process. The overall multivariate test was not statistically significant at the .05 level of
significance (Hotelling $T^2 \ 7.9466, F = 1.9572, p = .1025$) with 11 completed cases for the two-year group and 12 completed cases for the four-year group. This result failed to reject the null hypothesis of identical mean vectors between administrators, faculty, and staff at two- and four-year colleges in their perceptions of the effectiveness of continuous quality improvement training; and, therefore, the second hypothesis is supported.

Chapter Summary

The procedures for this study involved an analysis of the responses to a questionnaire which was distributed to 524 individuals at two- and four-year colleges in the United States that had been identified in the literature as being involved in continuous quality improvement processes. There were 324 questionnaires returned and 211 of these affirmed activities in training for continuous quality improvement and formed the basis for the data coding and analysis. Data analysis was reported for each of the eighteen research questions using a variety of statistical techniques. The statistical results for the two hypotheses which were derived from the research questions were also reported.
CHAPTER V

SUMMARY, DISCUSSION, CONCLUSIONS, AND IMPLICATIONS AND RECOMMENDATIONS

Introduction

Chapter 5 is organized into five main sections: summary, discussion, conclusions, and implications and recommendations for further research. The summary of the study outlines the rationale and purpose for the study, the research procedures which were undertaken, and the findings. Discussion of the findings is presented and related to the literature review. Implications for the research findings are addressed, and recommendations for additional research are related to the findings.

Summary of the Study

Rationale for the Study

The rationale for the study resulted from recent interest demonstrated by higher education institutions in their adoption and adaption of continuous quality improvement (CQI) processes, a popular management philosophy (Seymour, 1995, 1994, 1993d; Entin, 1994, 1993; Entner, 1993; Fisher, 1993; Hendley, 1992; Horine, et al., 1993; Mangan, 1992; Coate, 1991, 1990; DeCosmo, et al., 1991; Marchese, 1991; Sherr & Lozier, 1991; and Cornesky, et al., 1990). In particular, the need for appropriate training in the philosophy and
tools of continuous quality improvement has been deemed integral to the success of the management system; and certain implementation characteristics have been identified as essential to ensure training program effectiveness (Seymour, 1996; Horine & Hailey, 1995; Coate, 1993; Entner, 1993; Fisher, 1993; Sherr & Teeter, 1991; Stieber, 1991).

The research design and survey instrument were based on a previous investigation of private businesses that were involved in the practice of total quality management. In a descriptive research study, Stieber (1991) focused on the identification of implementation characteristics of quality training programs and the relationship of those training program variables to quality training program outcomes or measures of effectiveness.

Problem and Purposes of the Study

The problem of this study was to identify and describe the implementation characteristics of continuous quality improvement training programs and to determine whether or not and to what degree relationships exist between the implementation characteristics and training program effectiveness, as perceived by selected individuals at two- and four-year higher education institutions in the United States. The specific purposes of this study in relation to the perceived effectiveness of training programs for the implementation of continuous quality improvement processes at selected higher education institutions were to:

1. identify through the literature and verify through experts the extent to which higher education institutions are involved in continuous quality improvement training programs;
2. describe how the institutions are organized for training personnel in the philosophy and tools of total quality management;

3. determine which methods of training are perceived to be effective in implementing the total quality management philosophy in higher education institutions;

4. describe the best practices for total quality management training at selected higher education institutions;

5. describe the impact of total quality management training programs within these institutions; and

6. provide information and direction for professionals charged with making decisions associated with the implementation of training programs for total quality initiatives in higher education institutions.

Method of Procedures

The procedures for this study involved the designing of a descriptive survey instrument based on previous research and based on a review of the literature. The survey instrument was assessed for content validity by a panel of experts. A pilot survey was conducted using a random sample of individuals at two- and four year colleges who had indicated subscribing to a continuous quality improvement process. Initially these returns were examined to determine if there were any misunderstandings or obvious faults with the instrument. The returns were compared with a later mailing to respondents from the same institutions; and because only minor differences were found, reliability was inferred.
After the pilot survey questionnaires were analyzed, the survey instrument, along with a cover letter and return envelope, was mailed to selected individuals at 524 two- and four-year colleges that were identified in the literature as being involved in continuous quality improvement processes. A 63% return rate was achieved. Only those respondents who indicated involvement in a continuous quality improvement training program were included in the study (n =211).

The completed survey questionnaires were used to code the data and present the results which were obtained after the execution of a variety of statistical procedures. Anecdotal comments from the respondents were summarized and are included in Appendix C.

Summary of the Findings

The findings of the study align with the responses to the eighteen research questions and two hypotheses that were investigated to identify and describe the implementation characteristics of continuous quality improvement training programs and to facilitate an examination of the nature of relationships between implementation characteristics and perceived training program effectiveness for quality training initiatives. The major findings are presented based on the results of the survey.

Demographic Profile of Respondents. An analysis of the demographic profile of those colleges participating in CQI training revealed a wide range in terms of institution size, based on the number of students enrolled and the number of persons employed. Both large and small institutions were involved in
continuous quality improvement training. Those persons completing the survey instrument were predominantly administrators who held various position titles such as president, vice president, provost, dean, quality coordinator, director of institutional research and planning and director of human resources. A majority of the respondents indicated that they had been involved in CQI processes between two and five years and employed either a full- or part-time person to coordinate the implementation of quality improvement practices as well as the direction of the training functions.

Profile of Quality Training Participants and Processes. While participation in quality improvement training programs was not considered to be mandatory by a majority of the respondents, more than half indicated that their employees voluntarily attended the sessions which were delivered at periodic intervals. Administrators and supervisors were the employee groups that had the highest participation in training programs. However, overall findings indicate that a relatively fair amount of the employee populations are being trained at all levels of the respondent colleges.

Measurement of Perceived Training Program Effectiveness. More than 70% of the respondents indicated that a majority of those persons trained in quality processes had an opportunity to evaluate the training program. In addition, 36% indicated that they were currently in the process of assessing the quality improvement training function. When asked how the evaluation was conducted, based on the four levels of effectiveness proposed by Kirkpatrick (1975), respondents indicated overwhelmingly (almost 74%) that they had
evaluated training effectiveness at the first level—participant reaction. The remaining three levels of evaluation were also used but to a much lesser degree—assess actual learning, 41% (n=86); assess behavior change, 26% (n=54); and assess organizational change, 36% (n=75). However, respondents indicated a positive response for perceived effectiveness at each level of evaluation. In order to assess new skills learned, 20.6% of the respondents indicated the use of pre- and post-testing. Assessing behavior change or new skills used appears to be more difficult to achieve. Respondents noted varied approaches such as observation, interviews, surveys, and performance evaluations. Assessment of positive organizational change was also observed or measured through climate surveys. When rating the perceived improvement in selected areas of the organization, improvements were noted in all areas except for the classroom environment. Also respondents perceived an improvement in each of the work process areas as a result of CQI training. In the area of cost of quality, there was perceived improvement as well as an equal perception of regression which is most likely related to the cost of conducting CQI training itself.

Identification of Implementation Characteristics. The identification of major implementation characteristics included the philosophies, tools, processes, and content segments that are a critical part of quality initiatives. A wide variety of quality philosophies and tools appears to fashion the training program design at the respondent colleges. The Deming approach ranked highest, with more than 72% of the respondents indicating its use. A teaming
approach, the Baldrige Criteria, as well as the use of one of the more popular authors on quality (Crosby, Juran, and Peters) also ranked high. Almost 40% of the respondents indicated that they may use more than one of the philosophies and/or tools, confirming a more eclectic approach to the training process. The use of a variety of content segments was also verified with respondents indicating a multiplicity of selections. Quality awareness, management and leadership improvement, problem solving tools, teaming, interpersonal skills, and customer service training were used by more than 60% of the respondents.

Beyond the major implementation characteristics of philosophies, tools and content segments, additional implementation characteristics were identified and analyzed. More than 70% of the respondents indicated support for the training program from the top management of the colleges, which included both the president/chancellor and the next level of administrators such as vice presidents and provosts. Overwhelmingly, neither attending the quality improvement training nor assessing skills used on the job were part of performance reviews, with more than 65% of the respondents responding in the negative. The majority of the respondent colleges indicated that they used both internal and external trainers in the training function and were equally pleased with the results from each type of training. For internal training programs, there is some involvement of managers and supervisors in the instructional process, but less than 50%. In terms of initiating pilot projects across the campus, over 60% of the respondents answered in the affirmative and indicated the dominant areas of interest to be in the administrative and support service work units of the
college. The allocation of funding for the implementation of quality improvement training programs at the respondent colleges averaged $50,000. Total budgeting for quality improvement training appeared to be equal for both the two- and four-year colleges. The results of a Spearman, ranked non-parametric correlation coefficient matrix revealed no statistically significant relationship between the allocation of funding for quality training and the perceived effectiveness of such training.

Relationships between Major Implementation Characteristics. Several Spearman ranked, non-parametric correlation coefficient matrices were executed to determine the relationships between the philosophies, tools, and content segments to the areas of organizational development as well as to the various work processes. In the Spearman matrix featuring philosophies and tools and organizational development areas, both Senge and the Baldrige Criteria were associated with the perception of improved leadership. In the Spearman matrix featuring philosophies and tools and work processes, Crosby was associated with the perception of a decrease in waste. In the Spearman matrix featuring content segments and organizational development areas, there were several statistically significant associations. These included training in quality awareness (work environment), management and leadership (leadership), team leadership (work and classroom environment), and training in team process improvement (work processes and classroom environment). In the area of perceived improvements in processes relevant to certain administrative and support areas, several content segment areas emerged as
statistically significant. These included team leadership (cost of quality, controlling waste, and decreasing service problems) and training in team process improvement (controlling waste).

Relationships between Implementation Characteristics and Outcome Measures for Training Effectiveness. A series of Spearman ranked, non-parametric correlation coefficient matrices were compiled to examine the relationships between the implementation characteristics or training program variables and the four criterion variables designed to measure perceived training program effectiveness. Only those associations which were statistically significant at the .05 level of significance are included in this summary.

The correlation matrix of major implementation variables featuring philosophy and tools yielded two associations with the outcome measures for effectiveness. The category labeled as other was related to the outcome measure participant reaction/opinion. Two associations emerged for the outcome measure of extent of new skills learned and included the use of Peters and the Baldrige Criteria. The correlation matrix featuring content segments yielded several statistically significant associations. Quality awareness training was related to the outcome measure participant reaction/opinion. Both process improvement training and the assessment of quality proved to be positively related to the outcome measure of extent of skills learned. Training in quality awareness, management and leadership, interpersonal skills, and team leadership were all positively associated with positive organizational change. A
negative relationship also emerged between this outcome measure and advanced statistical processes.

Other training variables were also correlated to the outcome measures for effectiveness to determine if any relationships existed at the .05 level of significance, through the use of a Spearman ranked, non-parametric correlation coefficient matrix. Those training variables which correlated positively with the outcome measure of rated reaction/opinion included: extent of staff support of training, rated effectiveness of internal trainers, and rated effectiveness of external trainers. Positive correlations of other training variables with the outcome measure of rated extent of new skills learned included: extent of faculty support of training, extent of staff support of training, extent of the use of external or internal trainers, rated effectiveness of internal trainers, and rated effectiveness of external trainers. Positive correlations of other training variables with the outcome measure of extent of new skills used included: extent of administrator support of training, extent of staff support of training, extent that skills used are part of performance reviews, and rated effectiveness of internal trainers. Positive correlations of other training variables with the outcome measure of extent of positive organizational change included: extent that board members, administrators, supervisors, faculty, professional staff and support staff are trained; extent of president/chancellor, administrator, faculty and staff support of training; extent that skills used are part of performance reviews; rated effectiveness of internal and external trainers; and the extent that supervisors
and managers are involved in the instructional processes for the quality training program.

**Multiple Regression Analyses of Outcome Measures for Perceived Training Program Effectiveness.** In order to ascertain the relative importance of each of the statistically significant implementation characteristics in explaining the variation in perceived quality training program effectiveness, a series of stepwise multiple regression analyses were executed for the each of the four outcome measures of effectiveness—rated reaction/opinion, the extent of skills learned, the extent of skills used, and the extent of positive organizational change. All of the implementation variables that correlated with an outcome measure at the .05 level of significance in the Spearman ranked, non-parametric correlations were entered into each regression analysis using the stepwise method, based upon their ability to explain a significant proportion of the variance.

The major implementation variables that were significant via the Spearman matrices, and which included philosophies, tools and content segments, yielded several predictor variables based on the regression analyses. The philosophy/tool category labeled as other and the content segment identified as quality awareness together explained 6% of the variance for the outcome measure of rated reaction/opinion. The content segment variable, assessment of quality, explained 9% of the variance for the outcome measure extent of new skills learned. For the outcome measure of extent of positive organizational change, the content segment variables identified as
team leadership and management and leadership in combination explained 27% of the variance.

In addition, four stepwise multiple regression analyses were executed to reveal the predictor variables relating to the other statistically significant training variables or implementation characteristics of quality training programs and their ability to explain the four outcome measures of effectiveness. This process also yielded several predictor variables. The independent training variables identified as rated effectiveness of both internal and external trainers in combination accounted for almost 20% of the variance for the outcome measure of rated reaction/opinion. The independent training variables identified as faculty support of training and rated effectiveness of internal trainers together accounted for almost 19% of the variance for the outcome measure extent of new skills learned. The independent training variable identified as rated effectiveness of internal training accounted for almost 14% of the variance for the outcome measure of rated extent of new skills used. And for the outcome measure of rated extent of positive organizational change, the independent training variables identified as staff and faculty support of training accounted for almost 23% of the variance.

Testing for the Two Hypotheses. The findings for the two hypotheses that were derived from the research questions were as follows:

Hypothesis 1 (Research Question 9): There will be no significant difference between administrators, faculty, and staff, at two- and four-year colleges, in their perceptions of the degree to which top management has
supported continuous quality improvement training programs. The multivariate, Hotelling $T^2$ test showed a significant overall difference ($Hotelling\ T^2 = 50.98, F = 12.56, p \leq .0001$) between administrators, faculty, and staff at two- and four-year colleges in their perceptions of the degree to which top management has supported continuous quality improvement training programs. Consequently, Hypothesis 1 was rejected.

Hypothesis 2 (Research Question 18): There will be no significant difference between administrators, faculty, and staff, at two- and four-year colleges, in their perceptions of the effectiveness of continuous quality improvement training programs at their institutions. The multivariate, Hotelling $T^2$ test was not statistically significant at the .05 level of significance ($Hotelling\ T^2 = 7.9466, F = 1.9572, p = .1025$) with 11 completed cases for the two-year group and 12 completed cases for the four-year group. Consequently, Hypothesis 2 was substantiated.

Discussion of the Findings

The literature review, as well as the findings from this study, support the need for further information and direction for professionals charged with making decisions associated with the implementation of training programs for continuous quality improvement processes. However, while a considerable number of two- and four year colleges have indicated involvement in CQI training initiatives, many start-ups result in less than expected outcomes which
is primarily attributed to a weakness of the implementation process as well as to the strength of the culture of the campus (Sloan, 1994).

Demographics

While the research study yielded an adequate return of 63%, almost 37% of those respondents indicated that their college had not yet committed to the management concept, had abandoned quality training practices, or were at the beginning stages of the implementation process. Overall, those persons who returned the survey unanswered indicated their personal support for the concept of continuous quality improvement. Comments from the respondents indicated that the implementation process was quite a challenge, implying that adoption of the management system was often predicated on who provided the leadership for the successful implementation of the process as well as on other intervening circumstances such as retrenchment issues and the need for moral support from all employees.

Those institutions that indicated current practice in quality training and in continuous quality improvement processes were not disparate in terms of institution size—of both employees and students—indicating a wide breadth of involvement in the two- and four-year colleges. Many of the larger institutions were organized by divisions or colleges when there was no champion from the president or chancellor to support the effort. The literature supports the concept of finding champions within the organization to provide leadership for the implementation of continuous quality improvement since many higher education institutions are trapped in the myths and traditions which have
nurtured the campus culture and which may prevent quality processes from taking hold (Carroll, 1994; Seymour, 1992, 1993d; Coate, 1993; Cornesky et al., 1991). The majority of the respondents had been involved in continuous quality improvement processes between two and five years which is considered to be, according to the experts in the field, in a formative phase in terms of embracing such systemic change (Horine & Hailey, 1995; Entner, 1993; Coate, 1991; and Crosby, 1979). Many of the anecdotal comments from the respondents indicated that certain aspects of the evaluation processes had not occurred because the CQI process was in its beginning stage.

Measures of Perceived Training Program Effectiveness

The results of the study found that assessing reaction to the training program was the most frequently employed evaluation technique. This substantiates the literature which describes this method of evaluation as the easiest to implement as it takes usually takes place immediately after the training sessions (Krein & Weldon, 1994; Michalak & Yager, 1979; Kirkpatrick, 1975; and Tracey, 1968). While other levels of evaluation were utilized by the respondents, the numbers were small. The length of time involved in quality processes and training specifically may also help to explain this deficiency.

When respondents evaluated the perceived improvements in various organizational areas, the least affected area was that of the classroom environment which supports the literature findings that instruction is generally the last area of the organization to adopt the quality philosophy (Horine & Hailey, 1995; Jones & Timmerman, 1994; Seymour, 1993b, 1992; Coate, 1993;
and Ewell, 1993). Respondents also perceived improvement in specific work processes such as controlling waste and solving service problems as a result of the quality training program. However, in the area of time on task, there was a perception of some regression, which is most likely attributable to a perceived increase in the amount of time spent in training, as well as in working in teams and adhering to the new types of group processes.

**Identification of Implementation Characteristics**

All of the implementation characteristics which were revealed as elements of the quality training programs in this study are described in the literature as well as in other research studies as critical elements (Seymour, 1995, 1992; Peterson, 1993; Stieber, 1991; Winter, 1991; and Spanbauer, 1987). The wide variety of philosophies, tools and content segments utilized in the quality training programs were especially effective in providing an awareness level of the management process. Other characteristics such as support of top management for the training program and the use of pilot projects were common to the quality training programs as well. Interestingly, a majority of respondents indicated that there were no requirements for mandatory participation in training or for assessment of employees using skills on the job. Deming (1986) underscored his opposition to performance assessments, preferring to look at processes as indicators of improvement needs.

The cost of quality is another question that comes up frequently when embarking on the quality journey. The results of the study, however, indicated that the allocation of funding for quality training has a negligible effect on the
perceived effectiveness of such training. However, dollars expended for training programs may escalate when the training is outsourced to consultants.

Relationships between Major Implementation Characteristics

The relationships between the major implementation characteristics of philosophies, tools and content segments were indicative of expectations based on the literature. Notably, Senge and the Baldrige Criteria were related to improved leadership which is an underlying theme for both of these variables. Those content areas which emerged as positively related to both organizational areas and work processes once again revealed associations that would be expected. Quality awareness, leadership, teaming, and process improvement training are considered to be the basic underpinnings for effective training in continuous quality improvement processes (Seymour, 1996; Juran, 1989; Ishikawa, 1986; Deming, 1986; and Crosby, 1979).

Relationships between Implementation Characteristics and Outcome Measures for Training Program Effectiveness

The relationships between the major characteristics of philosophy, tools, and content segments and the four levels of effectiveness did not reveal any extensive associations. However, the use of Peters and the Baldrige Criteria were associated with perceived effectiveness for the extent of new skills learned. Each of these are extremely prescriptive in terms their suggestions for the implementation of quality processes. When correlating content segments to the four levels of effectiveness, there were associations that related to the primary concepts of quality awareness, team process improvement and
leadership which are considered to be critical elements for any quality program (Seymour, 1996; Fisher, 1995; Stieber, 1991; and Gitlow & Gitlow, 1987).

The other training variables which were positively associated with the outcome measures were supported by the literature review as well as other research (Seymour, 1996; Horine and Hailey, 1995; Carroll, 1994; Bonstingl, 1992; and Stieber, 1991). The use of and the rated effectiveness of both internal and external trainers related to several of the outcome measures. No doubt, it is essential to provide high caliber training whether it is delivered by the employees of the college or paid consultants. However, this variable had an inverse relationship to the outcome measure of new skills learned ($r = -.2127$) which demonstrates that both types of trainers were perceived to be effective. Both support of the training effort and the extent that employee groups were trained was also significant for all employee groups in at least one of the outcome measures. In particular, for the outcome measure of extent of positive organizational change, there were ten relationships that indicated the importance of support for the training program as well as actual participation in the program.

The research study revealed that the majority of respondents depended upon the president/chancellor or other upper level administrators for steering the quality training functions which were achieved through both internal and external resources. Stieber (1991) found that the level of top management support was also significantly related to perceived effectiveness of the training program. Interestingly, the extent of faculty support of training had the highest
correlation to this outcome measure \( r = .6009 \), which is indicative of the impact that faculty can have on the culture of the campus. The extent that skills used are part of performance reviews had an inverse relationship to positive organizational change which explains the current reluctance to relate quality improvement training efforts to performance.

**Predictor Variables for Outcome Measures of Effectiveness**

Major implementation characteristics as predictor variables. Both quality awareness and the use of an eclectic approach to training emerged as predictor variables for the outcome measure of rated reaction/opinion. Instruction in quality training usually begins with sessions about quality awareness, and most likely the majority of those colleges that were involved in training for less than two years had completed this level of instruction. Using a variety of philosophies, tools and techniques is also quite common, especially in higher education institutions where there may be a preference to find less business oriented materials and champions. The content segment of assessment of quality emerged as a predictor variable for the outcome measure of new skills learned. This is quite understandable since assessment is critical to any type of learning process, especially one that is focused on continuous improvement. The Baldrige Criteria as well as Deming focus on assessment by data and fact as the means to determine effectiveness. Positive organizational change was perceived to be impacted by a concentration on the principles of team leadership and management and leadership. Again, this is indicative of the literature findings which emphasize that solid management and leadership
roles in an organization are vital to effective quality processes (Seymour, 1996, 1992; Coate, 1993; Juran, 1992; and Stieber, 1991).

Other implementation characteristics as predictor variables. The effectiveness of both internal and external trainers emerged as significant predictors for rated reaction/opinion. If the training is good, the participants will respond accordingly. There being no discrimination between the two types of trainers would lead to a question of which was most cost effective. No doubt, the use of consultants adds tremendously to the cost of quality; therefore, the use of internal staff may be economical and at the same time yield further support from those being trained.

The predictor variables that emerged for the outcome measure of extent of new skills learned were the extent of faculty support of training and the rated effectiveness of internal trainers. It is apparent that faculty support of training would relate to new skills learned since this employee group has as its main focus the teaching and learning processes. Again, the perceived effectiveness of internal trainers has a predictor effect on this outcome measure which further supports their use in the quality training program.

For the outcome measure of extent of new skills used, the rated effectiveness of internal trainers emerged as a predictor variable. The use of internal trainers shows its strength once again and most likely has a positive effect on the skills being used because those who are doing the training are also actively participating in the day-to-day operations of the organization where they can model the same skills they teach. Also the extent of staff support
as a predictor variable for this outcome measure supports the wide use of pilot projects where staff members are more likely to be involved, thus using the skills they have learned in the quality training program.

For the fourth level of effectiveness, the extent of positive organizational change, two predictor variables emerged—both the extent of faculty and staff support of training. Each of these employee groups can have a significant impact on the quality initiative. Generally, faculty are the last employee group to position themselves as supporters of CQI programs. They are the primary force that creates the culture of the campus; and, no doubt, their support of the quality training program will impact the tenor of the climate of the campus. Staff support of training will also impact positive organizational change if those trained are actively involved in pilot projects, thus proving the utility as well as the validity of the skills learned in the quality training program.

Conclusions

Based on the findings from the analysis of the data, as well as from the review of the literature, the following conclusions are derived as they relate to the purposes of the study:

1. Training programs for the implementation of continuous quality improvement processes are being used at both two- and four-year colleges in the United States regardless of institution size. Overall, it appears that the study population perceives the training function positively for each level of effectiveness. However, evaluation of such training programs at all of the levels...
of effectiveness is not a common practice. The first level of effectiveness—reaction to the training—is the most often used measure to assess training programs. The assessment of skills learned, skills used, and ultimately the measurement of campus climate or positive organizational change are considered to be more difficult to undertake in the training programs. However, in the case of training for CQI it is even more essential to include all levels of measurement to underscore the inherent theme of continuous quality improvement within the training program function itself.

2. The implementation characteristics which were identified through a review of the literature as being significant to the training program were substantiated in the data analysis with the exception of three variables: attending the quality improvement training sessions is used as part of an employee's performance review; use of the skills taught in the quality training program on the job is part of the performance reviews; and training in quality improvement is mandatory for all employees. None of these variables emerged as essential elements or characteristics of the quality training programs. Business and industry may subscribe more closely to these characteristics since they are oriented toward a profit motive. At this time, higher education institutions are less inclined to mandate training and tie such training to performance; however, as accountability issues become more pressing and funding levels continue to diminish, colleges may reassess their approach to how accountability for quality fits into everyone's responsibility.
3. The predictor variables which related to perceived training program effectiveness included the following: (a) using a variety of philosophies, tools, and content segments; (b) training in quality awareness, team leadership, management and leadership, and assessment; (c) the use of internal and external trainers; and (d) the extent of staff and faculty support. As substantiated by the literature review, all of these implementation characteristics are critical to an effective CQI training process. Colleges currently involved in or beginning a quality initiative would be well served by identifying and including each of these characteristics as well as the other significant variables as critical components in their training programs. However, the actual reliability of these characteristics as predictor variables of effectiveness is suspect because of the low numbers of colleges indicating assessment at each of the levels of effectiveness.

4. The implementation of effective continuous quality improvement training programs is dependent on top management support and the training of employee groups particularly at the supervisory level and above. However, top management support for quality training programs was perceived to be greater at two-year colleges in the study population which may be influenced by the more pragmatic nature of the community college in its diverse mission and scope. In the academy, faculty support of the training function, as well as of CQI processes, appears to be quite low. Unquestionably, the primacy of the faculty
as de facto champions of quality education prohibits their unbridled acceptance of anything that smacks of faddism or relates to business and industry protocol.

5. The use of internal trainers was a significant predictor variable for each of the outcome measures of effectiveness, with the exception of rated extent of positive organizational change. However, whether training was conducted by using internal personal or outside consultants, it was perceived to be effective. When correlating funding for such training to perceived effectiveness, there was no significant relationship determined. Therefore, administrators involved in budgeting for quality training processes should not equate additional dollars expended to training program effectiveness.

6. While variation in quality training program outcomes can be explained by a variety and combination of implementation characteristics, it is important to consider that some of the percentage of variation could be attributed to the learning design that was used, as well as to other strategies not included in this study, and to measurement error inherent in the survey instrument itself (i.e. respondents interpreting questions differently).

Implications and Recommendations

Every two- and four-year college is a proponent of quality. Mechanisms are in place at higher education institutions that demonstrate and document quality—self-study accreditation documents, admission requirements, standards for grades, promotion and tenure criteria. Everyone appears to be for quality. But within the last decade there has been unprecedented demand for
higher quality in the academy. National reports have indicated that results are not forthcoming, and accrediting bodies have revised criteria to focus on outcomes assessment. Higher education may be for quality, but perceptions seem to indicate that higher education is not doing quality. The recent interest in continuous quality improvement processes by higher education institutions is indicative of the realization that quality has more depth, is more challenging, is illusive to some, and requires organizational transformation by adoption or adaption in its entirety.

Implications

Based on the review of the literature and the study findings, a program of training for quality initiatives is vital to the effective implementation of continuous quality improvement processes. The identification of the implementation characteristics for training programs will allow those persons charged with the planning, development, implementation, and assessment functions to focus on those elements that are integral to systemic change and ultimately to an improved campus climate. While each college is unique in its mission and goals, the system that defines quality processes is similarly structured for all practitioners.

Continuous quality improvement training must have the support of top management to succeed. A review of the comments on the survey instruments reveal that many quality initiatives are dependent on a champion to lead the effort. Those colleges that are successful in continuing the quality journey are driven by leadership that has defined a sense of purpose for the organization.
Training programs are best serving the internal customers when they include everyone. The lack of faculty support and participation in the training programs defeats the basic premise of constancy of purpose. Respondents mentioned that if they were to once again launch CQI on their campus they would involve faculty differently such as including them in the training process as opposed to hiring outside consultants. All employees of the organization must be committed to CQI if positive, systemic organizational change is to be achieved.

Both two- and four-year colleges seem to prefer a variety of philosophies, tools and content segments which focus on quality awareness, leadership, teaming, process improvements and customer service. In colleges that choose to focus on pilot projects or cross-functional teams, it is imperative that the training program include enough tools or practical advice so that teams are able to function successfully. One resounding commonality from respondents of the study population was that there are many approaches to the implementation of quality improvement training. No one right thing emerged in terms of facilitating the process.

Evaluation of the continuous quality improvement training programs appears to be based on undocumented successes described by the study population. Evaluation is common at the reaction/opinion level, but tangible results are less quantifiable and measurable. The use of the Balridge Criteria for Education may provide direction for those institutions desiring a more structured approach for the implementation of continuous quality improvement.
processes. Utilizing a Baldrige assessment, customer satisfaction surveys, organizational climate surveys, internal audits and student and staff surveys can provide for an effective formal evaluation system.

A final word to those considering the implementation of continuous quality improvement training programs is not to expect great successes in a short period of time. Most of the respondent colleges had been involved in continuous quality improvement training between two and five years and indicated that they were just getting started. Educators considering CQI should take time to research the process, visit other campuses, and digest the voluminous materials that are available in many formats. Quality is a continuous journey; training is just the first step.

Recommendations for Further Study

The current research investigation has revealed suggestions for further study in the following areas:

1. The baseline data developed in this study can be used for a longitudinal study in three to five years to determine what progress the respondent colleges have made in their training programs as well as in the implementation of continuous quality improvement processes.

2. A revised survey instrument, using the Baldrige for Education Criteria, could be developed to assess the extent of adherence to the principles of continuous quality improvement by the respondent colleges.

3. A study could be conducted employing the critical-incident technique. This would involve the investigation of the performance of various groups of
employees at those colleges who continue the quality journey after ten years. This type of study would reveal those attributes which have contributed to the success of the continuous quality improvement process.

4. Future research into relevant implementation characteristics such as content segments, top management support, use of internal and external trainers, extent of support of faculty and staff could attempt to establish causal links between the implementation variables and the outcome measures for training program effectiveness.

5. Much of the unexplained variance in each of the four outcome measures of effectiveness may be attributed to some other factor such as learning design, other implementation characteristics not included in this study, and measurement error of the survey instrument. Therefore, future research could attempt to account for the unexplained variance in perceived program effectiveness.

6. Certain implementation variables could be explored further to discover specific issues that are attendant to each, such as the extent of faculty support. Questions whether and why not faculty attended training sessions, participated in the instruction process, and took part in pilot projects could be studied to ascertain what impact each attribute of faculty has on the outcome measures of effectiveness pertaining to quality improvement training.

7. The survey instrument contained general questions regarding the four measures of effectiveness such as the use of pre- and post-testing, behavior change, and organizational change methodology. The instrument could be
further refined to include specific skills learned, behavior change and organizational change items that will elicit discrete methodologies for each.
APPENDIXES
APPENDIX A

TRANSMITTAL LETTER TO PANEL OF EXPERTS

LIST OF PANEL OF EXPERTS
October, 1994

TO: PANEL OF EXPERTS

Thank you for agreeing to participate as a member of the panel of experts who will validate the survey instrument to be used in my dissertation entitled "Implementation Characteristics of Effective Quality Improvement Training at Selected Institutions of Higher Education in the United States".

After numerous drafts and what seems to have been an inordinately lengthy process, I successfully defended my dissertation proposal at the University of North Texas, Department of Higher Education on August 11, 1994. The enclosed survey instrument is being sent to you for your analysis and suggested revisions. An abstract of the dissertation proposal, along with the survey instrument and a critique sheet is enclosed for your use in the validation process.

Please review the survey instrument and make suggestions for changes on the critique sheets. Also indicate whether or not a question should be retained by checking either "yes" or "no" next to each of the survey items. Those questions which have a 51 percent positive response will be retained. Additional questions will also be considered.

Please return the survey instrument and critique sheet in the enclosed, stamped envelope at your earliest convenience. I am targeting November 1, 1994, as the date to send out the revised instrument to a pilot sample for reliability testing.

Once again, I appreciate your affirmation of this important research by your acceptance of this task. I will keep in touch with you to let you know how I am progressing. If you are in need of additional information or have any further questions, please telephone me at Home: (817) 596-9988; or Work: (817) 594-5471. Also, my FAX number at work is (817) 594-0627.

Cordially yours,

Katherine C. Miller
Enclosures
APPENDIX: A
PANEL OF EXPERTS
For Validation of the Research Instrument

Robert Cornesky, Sc.D.
Total Quality Management Consultants
Specializing in Educational Institutions
489 Oakland Park Blvd.
Port Orange, Florida 32127
(800) 388-8682

Maude L. Holm, M.Ed.
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Cleveland, Ohio 44115-3239
216-987-3034

Margo Hirsch, Ph.D.
Director of Quality and Planning
Dallas Community College District
701 Elm Street
Dallas, Texas 75202
(214) 746-2451

Art Lacy, Group Education
Defense Systems and Electronics Group
Texas Instruments
7800 Banner Drive (P.O. Box 650311)
Dallas, Texas 75265
(214) 917-7516

Carol Mishler
Project and Research Services Mgr.
Fox Valley Technical College
1825 Bluemound Drive (P.O. Box 2277)
Appleton, Wisconsin 54913-2277
414-735-5600

Daniel T. Seymour, Ph.D.
Consultant to Higher Education
Q Systems
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(619) 778-8704

Stanley Spanbauer, Ph. D.
National Quality Academy
5 Systems Lane (P.O. Box 2277)
Appleton, Wisconsin 54913
(414) 735-4898
(800) 638-1202
APPENDIX B

SURVEY INSTRUMENT

TRANSMITTAL LETTER TO STUDY POPULATION

FOLLOW-UP POST CARD TO STUDY POPULATION

FOLLOW-UP LETTER TO STUDY POPULATION
### Survey of Quality Improvement Training Programs

**College/University Name**

**Type of Institution:**
- [ ] 2-Year
- [ ] 4-Year

**Number of Employees**

**Number of FTE Students (Yr.)**

**Public**
- [ ] Yes
- [ ] No

**Private**
- [ ] Yes
- [ ] No

**Respondent Name (Optional)**

**Position:**
- [ ] Admin.
- [ ] Staff
- [ ] Faculty

**Title**

---

1. **Is your institution currently involved in training its employees for quality improvement?** (If not, please check "no", leave the rest of the survey blank, and return it.)

   - [ ] Yes
   - [ ] No

2. **How many years has your institution practiced quality improvement?**

   - [ ] Less than a year
   - [ ] 1 to 2 years
   - [ ] 2 to 3 years
   - [ ] 3 to 4 years
   - [ ] 4 to 5 years
   - [ ] More than 8 years

3. **Does your institution have a designated quality improvement coordinator?**

   - [ ] Yes, Full-Time
   - [ ] Yes, Part-Time
   - [ ] No

   **If no, who is responsible for quality improvement?**

   **Position Title:**

4. **Have you evaluated the quality improvement training program you currently use by seeking participants' reactions to the program?**

   If "yes", rate the participants' overall opinion of the program.

   - [ ] 1 = Unfavorable
   - [ ] 2 = Somewhat Unfavorable
   - [ ] 3 = Neither Favorable nor Unfavorable
   - [ ] 4 = Somewhat Favorable
   - [ ] 5 = Favorable
   - [ ] 6 = Highly Favorable
   - [ ] 7 = Not available

5. a. **Have you evaluated the training program you currently use by assessing to what extent new skills have been learned?**

   If "yes", to what degree?

   - [ ] 1 = No new skills
   - [ ] 2 = Some new skills
   - [ ] 3 = Few new skills
   - [ ] 4 = Many new skills
   - [ ] 5 = Extensively using skills

   b. **Was pre- and post-testing used to assess behavior/attitude change before and after training?** (example: climate survey)

   - [ ] Yes
   - [ ] No
   - [ ] In Process

6. a. **Have you evaluated the training program you currently use by determining to what extent new skills are being used on the job?**

   If so, to what extent?

   - [ ] 1 = Not using skills
   - [ ] 2 = Somewhat using skills
   - [ ] 3 = Few using skills
   - [ ] 4 = Many using skills
   - [ ] 5 = Extensively using skills

   b. **If yes, how was employee behavior change evaluated?**

   **Please identify:**

---


7. Approximately what percentage of the following groups have received quality training to date?

(Circle number)

<table>
<thead>
<tr>
<th>Group</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Board Members</td>
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<tr>
<td>b. Administration (Manages total work units of functional staffs at top levels)</td>
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<tr>
<td>c. Chairs/Directors (Manages full-time and adjunct faculty)</td>
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<td>d. Supervisory (Manages Staff)</td>
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<td>e. Salaried Employees (Faculty)</td>
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<td>f. Salaried Employees (Professional Staff)</td>
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<td>g. Hourly Employees (Support Staff)</td>
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</tbody>
</table>

8. a. Have you evaluated the training program you currently use by determining if positive organizational change has occurred as a result of the training?

☐ Yes ☐ No ☐ Too early to evaluate

b. If yes, to what extent has positive organizational change occurred?

(Circle number)

1 = No noticeable change
5 = Some change
10 = Extensive change

Evaluate the effectiveness of your quality training program based on the following areas of your institution:

<table>
<thead>
<tr>
<th>Area</th>
<th>Got Worse</th>
<th>Remained the Same</th>
<th>Improved</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Work Environment</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Work Processes</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Customer Service</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Classroom Environment</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Other</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Note: These items may be relevant to certain administrative/support service areas:

<table>
<thead>
<tr>
<th>Area</th>
<th>Decreased</th>
<th>Remained the Same</th>
<th>Increased</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Quality</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Time on Task</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Waste</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Service Problems</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>Other</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
9. What, if any, specific quality philosophy or tools support your training efforts?

(Please rank: e.g. 1=most frequently used, 2=next, etc.)

- Conway
- Crosby
- Deming
- Feigenbaum
- Teaming
- Other (Identify):
- Ishikawa
- Juran
- Peters
- Peter Senge
- Baldrige Criteria
- None Specifically

10. What specific content segments do you include as part of overall quality improvement training?

(Please check as appropriate)

- Quality Awareness Training
- Management Practices/Leadership
- Interpersonal Skills
- Knowledge of Processes and Process Improvement Techniques
- Problem Solving Tools/Techniques
- Advanced Statistical Techniques
- Customer Service
- Inventory/Supplier Management
- Group Dynamics
- Team Leader Training
- Process Improvement Team Training
- Quality Function Deployment
- Assessment/Measurement of Quality
- None of the above
- Others (Please specify by name)

11. To what degree do you have moral support for the quality improvement training program?

(Circle Number)

1 = Low Support
5 = Moderate Support
10 = High Support

a. CEO: Chancellor, President
b. Administrators: Provost, V-P, Dean, Chair
c. Faculty
d. Staff

1 2 3 4 5 6 7 8 9 10
1 2 3 4 5 6 7 8 9 10
1 2 3 4 5 6 7 8 9 10
1 2 3 4 5 6 7 8 9 10

12. Is attending the quality improvement training sessions part of an employee's performance review?

- Yes  
- No  
- * Sometimes

* Comment:

13. Is using the skills taught in the quality improvement training program on the job made part of performance reviews?

- Yes  
- No  
- * Sometimes

* Comment:

14. To what extent does your institution use its own employees versus external consultants as trainers in the quality improvement training program?

- All Own Employees
- Both Employees and Consultants
- All External Consultants

15. Rate the effectiveness of in-house training vs. external consultant training.

- 1 = Not Effective
- 5 = Effective
- 10 = Very Effective

Internal: 1 2 3 4 5 6 7 8 9 10
External: 1 2 3 4 5 6 7 8 9 10
16. To what degree are the supervisors or managers involved in the instruction of the training program?  
(Circle Number)  
1 = No Involvement  
5 = Some Involvement  
10 = Significant Involvement  

17. a. Was an initial pilot program conducted to evaluate the quality training program?  
   b. If yes, in which work units of the institution?  

   □ Yes □ No  
   □ Administration □ Business Office □ Maintenance  
   □ Academic Prog. □ Student Services □ Cafeteria  
   □ Technical Prog. □ Library □ Other  

18. Approximately what percentage of those trained took part in any evaluation assessment of quality improvement training?  
(Circle Number)  
0 10 20 30 40 50 60 70 80 90 100%  

19. Is training in quality improvement mandatory for all employees?  
   If no, what percentage of those employees not required to attend training voluntarily attended the program?  

   □ Yes □ No  
   □ Information not available  
(Circle Number)  
0 10 20 30 40 50 60 70 80 90 100%  

20. Is your institution's quality improvement training scheduled during one continuous session, as periodic sessions with employees returning to their jobs between sessions, or as needed?  

   □ Continuous Session  
   □ Periodic Sessions  
   □ Combination of the two  
   □ Just-in-Time-Training  

21. What is the estimated annual budget for quality training at your institution?  

   □ $0  
   □ $1 to $9,999  
   □ $10,000 to $29,999  
   □ $30,000 to $49,999  
   □ $50,000 to $69,999  
   □ $70,000 to $99,999  
   □ $100,000 to $299,999  
   □ Over $300,000  
   □ Don't know  

ADDITIONAL COMMENTS (Please include any special characteristics regarding the way in which your institution's quality improvement training program has been implemented).  

Thank you for completing this survey. Please return it in the pre-addressed envelope provided.  
Would you be interested in participating in a follow-up interview about your CQI initiative? □ Yes □ No  
Check here if you would like to receive a summary of the final report.  

Katherine C. Miller  
Weatherford College  
308 East Park Avenue  
Weatherford, TX 76086  
(817)594-5471, Extension 336
April 24, 1995

Dear Colleague:

As a University of North Texas doctoral candidate, as well as an ardent advocate for quality principles, I am conducting a dissertation study to determine the perceptions of administrators and/or quality coordinators as to which methods of training are effective in implementing Continuous Quality Improvement (CQI) processes at higher education institutions across the United States. You have been identified in the literature as being a champion for the implementation of CQI processes in the educational and/or management systems at your institution; therefore, your assistance with the completion of the survey instrument is invited.

Your participation in this study will provide valuable information concerning the quality improvement training program at your institution. The results of this research will assist quality professionals and administrators with decisions on how to implement future training efforts associated with quality initiatives in their organizations. In addition, the findings will enable colleges and universities to make appropriate, cost effective choices when implementing training programs for CQI.

Please take a few minutes of your valuable time to fill out the survey instrument and also write any comments you may have concerning the items or other pertinent aspects of your experience with CQI. If possible, please return the survey instrument within two weeks, using the enclosed stamped, addressed envelope. In appreciation for your assistance with this survey, I will be pleased to send you a summary report of the findings. Please be assured that the information you provide is for research purposes only and will be held in strict confidence.

The ultimate benefits of this or any other survey depend on the thoughtful responses and willing participation from those who are asked to help. Your willingness to participate is important and extremely appreciated. Thank you.

Yours in quality!

Katherine Miller, Dean of Occupational Education
Ph.D. Candidate, University of North Texas

Enclosures

Note: If you do not have the information requested, please forward this packet, as soon as possible, to the person at your institution who can best provide accurate and timely data.
Recently you were requested to complete a survey instrument or to pass it along to someone else in your organization who is familiar with your CQI campus training effort.

The purpose of the research project is to determine the perceptions of administrators and/or quality coordinators as to which methods of training are effective in implementing Continuous Quality Improvement (CQI) processes at higher education institutions across the United States.

You have been identified in the literature as being a champion for the implementation of CQI processes in the educational and/or management systems at your institution; therefore, you can provide valuable information.

The results of this research will assist quality professionals and administrators with decisions on how to implement future training efforts associated with quality initiatives in their organizations. In addition, the findings will enable college and universities to make appropriate, cost effective choices when implementing training programs for CQI.

If you have any questions or need another survey instrument, please contact:

Dean Katherine Miller • Weatherford College
(817) 594-5471, Ext. 336 or E-Mail DMVX23A@Prodigy.com

Please take a few minutes and respond by returning the completed questionnaire within the week. Your comments are invited. Thank you!
July 28, 1995

Dear Colleague:

SUBJECT: YOUR ASSISTANCE WITH A QUALITY SURVEY PROJECT

Each day I rush to the mail box to see whether you have completed and returned the Survey of Quality Improvement Training Programs which was mailed to you several months ago. So far, I have not heard from you, but I still need your HELP!

As a University of North Texas doctoral candidate, as well as an ardent advocate for quality principles, I am conducting a dissertation study to determine the perceptions of administrators and/or quality coordinators as to which methods of training are effective in implementing Continuous Quality Improvement (CQI) processes at higher education institutions across the United States. Your response to the questionnaire is critical to the success of this study.

Please take a few minutes of your valuable time to fill out the survey instrument today and return it in the enclosed stamped, addressed envelope. Any comments you may have concerning the items or other pertinent aspects of your experience with CQI are also invited. In appreciation for your assistance with this survey, I will be pleased to send you a summary report of the findings. Please be assured that the information you provide is for research purposes only and will be held in strict confidence.

The ultimate benefits of this or any other survey depend on the thoughtful responses and willing participation from those who are asked to help. Your willingness to participate is important and extremely appreciated. Thank you.

Yours in quality!

Katherine Miller, Dean of Occupational Education
Ph.D. Candidate, University of North Texas

Enclosures

Note: If you do not have the information requested, please forward this packet, as soon as possible, to the person at your institution who can best provide accurate and timely data.
APPENDIX C

VERBATIM COMMENTS FROM RESPONDENTS
### APPENDIX: C
VERBATIM COMMENTS
FROM 'YES' RESPONDENTS

<table>
<thead>
<tr>
<th>NO.</th>
<th>ITEM RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>(3) Executive Steering Council</td>
</tr>
<tr>
<td></td>
<td>(6b) Self-evaluation as well as customer surveys.</td>
</tr>
<tr>
<td></td>
<td>(10) Facilitator training</td>
</tr>
<tr>
<td>002</td>
<td>(3) Director of Human Resources</td>
</tr>
<tr>
<td>003</td>
<td>(3) Director of Quality</td>
</tr>
<tr>
<td></td>
<td>(10) Effective meetings</td>
</tr>
<tr>
<td>004</td>
<td>(6b) Observation/Interview</td>
</tr>
<tr>
<td>005</td>
<td>(1) A limited number. We have a “continuous improvement core team,” and are bringing others in slowly.</td>
</tr>
<tr>
<td></td>
<td>(3) The “core team” has a leader (part-time) drawn from the faculty. The president is also key.</td>
</tr>
<tr>
<td></td>
<td>(5a) Assessed by observation and project success.</td>
</tr>
<tr>
<td></td>
<td>(17) Cross structure group.</td>
</tr>
<tr>
<td></td>
<td>(AC) A small team was formed and trained. That group now functions as the core of the effort and trains and guides other groups formed as needed.</td>
</tr>
<tr>
<td>006</td>
<td>(AC) In the middle of our quality program, the president retired and a new one was hired. This has delayed and changed the focus of our program.</td>
</tr>
<tr>
<td>007</td>
<td>(3) The President</td>
</tr>
<tr>
<td></td>
<td>(12) Not yet</td>
</tr>
<tr>
<td></td>
<td>(13) Not yet</td>
</tr>
<tr>
<td>008</td>
<td>(9) Whitley</td>
</tr>
<tr>
<td></td>
<td>(12) Manager/Supervisor only</td>
</tr>
<tr>
<td></td>
<td>(AC) I will mention that our initiator of quality improvement, Mr. Robert Saltonstall, Director of Physical Plant, was cordially helpful in completing this questionnaire. Our phone: (203) 685-3400</td>
</tr>
<tr>
<td>009</td>
<td>(3) The Quality Council (22 members)</td>
</tr>
<tr>
<td></td>
<td>(7a) The Quality Council</td>
</tr>
<tr>
<td></td>
<td>(10) These six areas have been included in the training of our Quality Council. We have not yet started to work with improvement teams.</td>
</tr>
<tr>
<td></td>
<td>(11) Don’t know yet.</td>
</tr>
<tr>
<td></td>
<td>(12) The performance of top management will include an evaluation of their efforts to improve quality.</td>
</tr>
<tr>
<td></td>
<td>(13) For top management. Only at this point.</td>
</tr>
<tr>
<td></td>
<td>(14) We expect to use all our employees as we expand.</td>
</tr>
<tr>
<td></td>
<td>(16) Not yet.</td>
</tr>
</tbody>
</table>
A twenty-two member Quality Council has been appointed.

Not yet—in the planning stages.

Executive Director CQI.

Involvement of faculty in design and instruction.

Just started quality improvement efforts at the college.

Unit is a 170 person department/school size.

Council members were initially trained and then became facilitators for department.

Evaluation—surveys

Yes, full-time in hospital

Enrollments is responsible in Enrollments Division.

Through homework assigned during training, through monitoring groups, through individual performance appraisals, through staff meetings.

"I can't answer for the hospital." Everyone in Enrollments Division. Only a handful staff outside of the division.

Not formally.

Informal assessment, just within division.

Have been some savings results.

In facilitator training, not general training.
020 (Cont'd.)
(12) But all employees must attend.
(14) Now—used consultant initially.
(15) External, when we used it.
(17a) The groups within the Administrative unit.
(19) In our division.
(21) In our division. Can't speak for the hospital.
(4) Previously external vendor, now changing to in-house.
(8c) Very early, hard to assess.
(9) None specifically for the most part.
(12) Union implications.
(15) Don't know yet.
(16) Planned.
(21) Salaries included.

021
(6) Questions on a baseline survey with plans to have informal campus visits.
(12) The HR person does not see the connection for success.
(13) That is a part that needs to be further developed.

022
(7) Estimates.
(12) As determined by supervisor.
(13) As determined by supervisor.

023
(3) Quality Steering Committee.

025
(15) Depends on the individuals.
(AC) We did a pilot program. There is no upper management support to continue even though the initial results were good for 3 of the 4 teams.

026
(6a) Not formally.
(6b) Incremental learning has occurred.
(12) Support staff.
(19) Initially, 100 percent.
(AC) We now support a variety of just-in-time training all of which is customer and process focused and which relates to skill areas of staff, i.e., is collaborative learning, CAT's for faculty, Covey's 7 habits for staff, extensive computer training for all, and administrative quality awareness program.

027
(6b) Self-report survey
(7) All faculty and staff were invited to attend orientation sessions on our quality initiatives. About 90% participated.
(8c) Not sure.
(9) A blend of the above, plus others especially our university's emphasis on communities.
(12) Wish it was.
(13) Ditto.
(17) Cross-unit.
(19) All are invited.
(AC) See envelope with history attached.
Dean of Business and Technical Education.

Our program is a partnership with the local chamber, local business leaders, educators and government employees also train in our programs.

I answered according to what I do in the Industrial Management Program. These answers do not apply to the college as a whole.

The philosophy of the Board and President is such that TQM will not occur on our campus in the foreseeable future.

The President's Executive Council.

Peer Supervisor internal customer survey Goetsch/Davis which combines all of these.

Strategic planning.

We used all of these at one of our campuses.

"Pockets of excellence"

Goal/QPC, tools, problem planning, Joel Barker, Paradigm Shifts, Future Search Process.

Organizational Change, Rewards and Recognition (being developed), Creativity and Breakthrough Thinking, Communication Styles.

Needs to be.

Should be.

Supporting role

Staff—self—scheduled

Possibly instead of training general, self-selected employees. We are finding that training entire divisions or departments at one time works well (Key concept! with the support of the director. Teams are begun on the spot and organizational routines are confronted. There is employee buy in and tools are just not taught but utilized during the session.

Survey of past attendees at training sessions.

Planning and Management team training.

We are in process of revising our employee performance evaluation processes.

Mixtures of units.

To date

We have tried to let units "self-select" for training. This assumes that training goes first to those most interested in receiving it—and, in my view, most likely to put it to good use.

Added interest, better customer focus.

Informally.

Level of concern.
(13) Working its way into our strategic plan.
(14) Almost all.
(17) Accreditation Committees.
(AC) We continue to develop very active external programs, training, and assistance to others, and a modest internal program that is not moving fast enough.

(3) Director for Continuous Improvement
(6b) Monthly reports.
(7b) 100% for Business and Financial divisions only.
(9) Kano, Heidbreder
(10) Statistical techniques—Basic, S.I.P.O.C. Functional Mapping, Benchmarking
(12) Depends on who.
(13) Depends on who.
(20) All.

(1) It believes it is.
(3) No one designated.
(8c) Cost of Quality—Not even understood
Waste—Not measured
(10) All are taught in my class (actively learned) but this university does not practice/understand CQI/TQM—this applies to faculty, staff and especially administration.
(17a) Are you kidding?
(AC) Don’t know where you got the Dean’s name on what list but trust me, this institution does not really train its employees in TQM. Lowest level support people are shown Barker’s video, sleep through lectures and do some role playing on “how to smile when you say no we’re not meeting your needs.”

(3) No single individual responsible.
(AC) Training has been provided only for employees participating in process improvement teams, and for their supervisors. A training session was also provided for executive leadership.

(3) Various

(8c) Other—Morale.
(13) Not formally.
(17b) Sampling of several.
(19a) Non-faculty.
(AC) Using the term “skills” as in #5b there is a great deal of faculty that do not relate to “skills”, general, e.g. awareness, understanding, attitude, etc.

(3b) VP for Quality and Professional Development
(6a) Not currently, but have in past.
(13) Do not have performance reviews.
Surveys (written), small group dialogue, observation, staff/faculty meetings.

Other—Attitude

Too many sources to name, the above are significant, Deming and Senge used heavily.

Others—Systems thinking.

We do not do performance reviews. Deming’s 7 deadly diseases.

Other—Admissions Office.

The Center for Quality (Primarily Responsible for Training) is self supporting via training of external customers. We do not pass the cost of CQI training on to the students.

I am not sure these are the right questions or that they address your problem statement: “perceptions etc.” The questions do not reflect nor accommodate the diversity or approaches being used in higher ed nor the differences between 2 year and 4 year institutions with different cultures.

We are taking a “systems” approach by trying to identify, map, and define our major system on each campus, each sub-system, and each process.

We are currently doing a fairly extensive self-assessment using the new “education” Baldrige Criteria. We are fortunate to have Linda James (former member of Baldrige team at NIST) and Donald C. Fisher (author of Baldrige books) to lead this assessment. No final results available. Our Quality program does not fit some of your questions, I’d be happy to explain our program to you if you want more information.

Increased involvement of faculty, staff, and administration in ongoing operations of the college. Working toward this being true across the board.
As for special characteristics regarding the way in which our institution's quality improvement training program was implemented, I would say that there were many folks involved, all of whom represent a broad spectrum of our college community. They included faculty, staff, administration and students.

Depends—different areas have started at different times. <1 year: Colleges in partnership with Ford Motor Co.; 2-3 years: Administrative Support areas; 3-4 years: OSU Medical Center.

Coordination is de-centralized.

Evaluate individual workshops that are currently offered (each area doing training does their own evaluations). My estimate of average ratings across programs.

Have adopted the materials used by Xerox which is actually a hybrid of the above.

This is the plan for the new performance management system being developed, not currently being done.

Again, there is no one training program. Some units involve managers, some don't.

It was hard to address the majority of the questions because of the decentralized way in which quality is being implanted at OSU. The areas that are the most active includes: Human Resources and Business and Administrative (two academic support units), the Medical Center, and the four colleges partnered with Ford: Medicine, Business, Engineering, and Agriculture.

In process

We have some champions in the Administrative and Staff areas. We started with cross-functional teams which had charges that were too broad. We are pushing work on a natural work place level which will have more positive outcomes, but takes more energy and time to achieve our objectives.

Director of Planning and Evaluation

Director Training and Professional Development.

Too early in training

Not currently

Not currently

Top management, just beginning the process for all employees.

Director—Planning and Development

One faculty session was very positive.

Intro

Beginning

Pull from many sources to develop our process.

All own employees—for the current process

All External Consultants—for the beginning process.
(15) Too early to tell.
(16) All employees can participate as facilitators—will not limit instructors to administrators.
(19) No for all employees, yes for top administrators.
(AC) Employees are skeptical of just promoting quality improvement—they heard more than they have seen results. We are now developing our strategic planning process using principles and tools of continuous improvement.

(6b) Survey of the college divisions.

(17b) Cross Functional

(AC) I refer to it as "quality on a shoestring"

(9) Spanbauer
(12) Not yet.
(13) Not yet

(3) Dean of Warton Campus
(8c) We have had a change of leadership at the top which affects the director of the Quality functions.
(15) Need both

(3) Assistant to the President—Organizational Development
(6b) Use of data in decision making, project team studies, team work—effective meetings, evaluations.
(8a) Not formally—survey in progress
(9) Classroom Quality: Cross, Angelo, Howard Gardner, Cornesky, David Lazar
(12) Class (faculty component) 12 hours mandatory 1995-96. Awareness and Process improvement training (16 hours) is mandatory.
(13) Some managers holding staff accountable.
(17a) Yes—in process improvement teams and tools with three teams
No—in Awareness training (8 hours)
(17b) Yes, in faculty class CQI program.

(3) Quality Steering Team
(7) Information not available

(3) Senior Management Team, Quality Steering Team

(3) Director of Industrial Effectiveness

(3) Not yet.
(9) Incorporated using Language of Commission on College's Info on Institutional Effectiveness.

(9) We use Total Quality Transformation from PQ Systems, Dayton, Ohio
As part of other duties

Informal assessment; reports by staff about uses in meetings etc. Some volunteer teams use tools and skills. Skills incorporated very well in some areas, less well in others.

Professional development (which includes QI training) is considered in performance review.

First team (and just-in-time training) served as model for others—Improvements were made for subsequent teams.

Training is "just in time", we have had six cross functional teams work on requisition code time, administrative processes, textbook acquisition and sales; part-time employment contracting, new student orientation and student access to college programs and services. They are completing work now with regional accreditation self-study in progress 94-96; new teams have not started. Will be glad to share details on team results. We at SCC have worked to integrate continuous quality improvement, institutional effectiveness and strategic planning with some success. We are making a strong effort for quality to be the why we do everything, not just another item in our "to do" list.

The first training is in progress and an evaluation has not yet been performed.

Mixture of all

This is the pilot.

We have just started our quality improvement. I am the primary instructor and am using many community groups as well. I have been teaching quality improvement to the community for three years and am very happy my own institution has finally started the process.

Various VPs have indicated and supported efforts from time to time.

We did an overall introduction to TQM with the faculty on a retreat, them trained and implanted some flow-charting and processes improvement efforts with staff involved in student services, financial aid, registration, class startup etc, which have provided improvements. The effort in this form is limited to our non-traditional program.

Great initial interest—no on-going training or follow-up. Not enough emphasis or rhetoric about changing culture (work environment). Results of assessment by administration either doesn't exist or are not public. Skepticism of CQI in lower ranks.

Question incorporated into the evaluation.

If applicable specific behavioral change regarded as necessary for effective performance.
CCIC (Continual Campus Improvement Coordinator)
Training programs, alumni sessions, (change discussions)
All employees take a 45-hour Deming course.
Students are also in the classes—all levels of employees, from custodial to secretaries, to faculty, to administrators are mixed in 20 student classes. Won IBM national quality grant ($1m).

Training is just six months old.
Cross-section
- Training models developed in-house.
- 99% of participants would recommend to others.
- Training occurs monthly, started October 1994
- Participating units are charged for courses.
- Courses are improved based on participant feedback.
- Training targeted for staff, not faculty.

N/A
Direct observation
Problems with resistance from deans and chairs; resistance from faculty. Low commitment to resources. Low probability of success.
We are currently in the process of adding it.
Motorola
We are in the early stages of developing customer awareness in a state-financed educational institution.
Co-chairs of steering Committee.
Partnership with Alcoa.

Every administrator.
Gardner
Combination of above.
Not finished yet
Our customer training is the only training with quality in its name. Our quality effort is called "revitalization".

Training is not "formally" quality improvement.
President
More responsibility assumed, fact-based decision making.
As CEO I have introduced quality concepts not as "quality" per se but as ways to improve efficiency and effectiveness. I have insisted on a "customer focus" and have initiated satisfaction surveys.
Benchmark employee satisfaction
Survey as benchmark
Depends on evaluator and division.
200

086 (Cont’d.) (13) See #12
(AC) Decentralized to VP/Provost level. Provost not participating. This is the most significant factor for mixed outcomes today. Quality Coordinator in Administrative Services VP area.

087 (6b) Use and performance
(10) Facilitator training

088 (3) Director, Core

089 (3) Assistant to VP for Business Affairs
(6b) Employees are finding the various tools helpful in their everyday activities and are reporting which of them they are using most often.
(10) Facilitator and team sponsor training
(17b) Postal Services
(19) Still in process
(AC) NAU’s training program started slowly and has been building over the last two years. No one is required to participate but interest continues to grow and more and more teams are being formed across campus as results of other teams become apparent.

090 (3) Director, Staff Development
(5b) One done, follow up to come.
(6a) Informally and anecdotally.
(6b) Observation of behavior.
(10) [Customer Service] Newest—not operational
(AC) See attachment. It was difficult to respond to some questions because while the statement said “we did this thing” it did not allow for degree or score of response.

091 (3) VP Instruction
(6b) Training provided only to those on teams.

092 (6b) Attitude assessment interview
(12) Level and union unit #
(13) Same as # 12
(AC) - Union environment
- State School
- Many local system constraints
- High percentage of tenured faculty (and staff) 90%+

093 (17b) Community services
(AC) 1) President stated commitment to quality.
2) I conducted a series of 10, two-hour seminars to initiate awareness on campus.
3) Preliminary team formed to attend TQM conference/training in the fall.
4) Plans to develop an executive steering committee after conference/training.
5) Great need for training. Knowledge and understanding very low on campus.
This has been a “bottom up” effort, and we seem to be at a standstill after some initial enthusiasm. Not enough leadership in quality practices by top administrators and managers. Faculty seems to hate TQM. Many staff managers working with faculty are reluctant to enforce change.

Only in certain areas though.

Of our division

Some is

I answered specific to our division Financial Management, as the whole university is not doing this.

Some components

Was 100%, recent turnover lowered it to 60%.

So far as marked

Soon will be

Last year and coming year for each.

Shared responsibility

Ad hoc basis

Can be included.

Case by case basis depending on supervisor.

Across the board.

We conducted two pilot projects to assess viability of doing quality on campus. We have done a variety of training on a voluntary basis which was well received. Now we do require quality orientation programs for all new employees.

Quality Coordinator

Amount of time. Number was reduced.

Varies with supervisor.

Just starting with consultant.

But have some information from most above — use information designed by consultant

We are 3/4 of the way through program with managers. Will add other section over the next few months.

Unknown at this time.

At this time, will be in the future.

To date, managers will implement once trained.

Will be in future.

Not yet.

Project teams

Our quality efforts have been pretty loosely defined. We have used project teams to “re-engineer” specific processes.
Director, University Leadership Development
Forming of CPI teams and changing of processes.
Covey. We have developed our own manual.
If made an objective in previous review.
Complicated history. False start then a reassessment, then a new start. Baseline data is mixed. Happy to talk about it. (540) 231-67279

Assistant to the President.

Faculty Assistant to the President
Action on team projects.
I do not understand the question.
Our program was developed out of the president's office through yearly planning objectives. Training goals were met for FY 94 but will not be met for FY 95—lack of time is the reason.

14 points of Deming
College has requested that all employees attend a 50-hour course. Course conducted by external consultant despite having recognized experts in house. No tangible improvement projects initiated. On plus side, President is seeking more campus involvement in decision making process.

But Yes to individual pieces in training session.
David Langford, Zenger, Miller, Glasser
Please read Deming and Pursig on philosophy of a performance review, annual ratings, MBO.
Both directed (top leadership) and by individuals seeking to do better in their individual situations.

President
More customer focused.

Dean, Technical Instruction

By number applying skills on job.
Starting to look at MBNQA-ED.
All are expected to attend.
None formally.
Support staff.

Facilitator, Quality Council
Facilitator, Process Improvement Teams
Working on this.
Working on this.
Staff.
Contact Wayne Short (316)441-5349, or Jim Miesner (316)441-5249, for follow-up information.

Quality Improvement Coordinator
Eclectic approach
You ask some good questions. I will be very interested in your summary.
203

114  
(2)  Not yet implemented.  
(13)  Only as improved teaching or service results.  
(17a)  This is our pilot.  
(19)  All volunteers, 12 of 24 eligible.  
(AC)  Improvements in the way meetings are conducted have been noted.  

117  
(1)  But see note under comments.  
(3)  Dean, College of Engineering.  
(19)  Not yet.  
(AC)  We are just starting a quality management training series from Eastman Chemical. This has been on hold a few months due to possible mergers of other programs into the college and possible resultant new key players. The other efforts are low key until we restart our major effort.  

118  
(3)  Director—Total Quality Initiatives  
(9)  All are used in varying degrees.  
(19)  Is available via voluntary participation.  
(AC)  Slow process, making progress. Have Quality Council in place, Revamping “vision” statement. Also, have had process action teams in place—doing some good work.  

119  
(6b)  More custom oriented toward students.  

120  
(3)  Director of Staff, Program Organization, and Development.  
(6b)  Asking about needs of internal customers. Defining process and using tools.  
(17b)  Computer Services.  
(AC)  Partnerships with local industry has helped us in our training.  

121  
(3)  Margot Hirsch, and college presidents.  
(4)  Varies.  
(5a)  Many training programs.  
(5b)  In some cases.  
(6b)  Varies by college.  
(8a)  Many varied programs.  
(8c)  At District Office.  
(9)  Eclectic—from almost all of them.  
(15)  External, varies.  
(AC)  Survey is exceptionally well done. I wish all surveys we receive were this professional.  

122  
(15)  In-house team is also an experienced consultant.  

123  
(3)  Next year responsibility to be handled by a team.  
(7a)  Don’t know, not my job.  
(8a)  In process.  
(8c)  Cost of Quality—In Process.  
(10)  Dean charts/conducts, Coaches training CQI/Assessment in the classroom.  
(12)  The entire program is voluntary.
We have placed strong emphasis on the natural workplace team.

See attached information.

VP, Industrial Advancement.

VP, Spiritual Life.

We are in our third year, much to be done. Our coordinator died last month—will take time to re-start. Will take 5-9 years to fully implement beliefs—good luck!

Assistant Vice President, CQI

Covey

Staff training

Glasser, mostly combination of about and others.

We don’t have supervisors.

We have recently formed a Continuous Improvement Council to formalize our training program.

Mine—Asst. Provost for Continuous Improvement

Deming Project Initiatives (group of faculty and staff)

Survey

Registration

Customer Sales

Dean required it for chairs in arts and sciences; Dean of Engineering uses TQM (required by grant), Dean of Business Management is involved.

Reach different groups

Depends

The top administrative support gives small grants to support teaching. The Deming Project is the main driver. Our units of faculty and staff. The new head of Language Dept. is a Deming convert. As is the Dean of Bus. Office. Applied the methodology to Math Dept. while I was chair 1989-92. Some of those initiatives remain (rather than dysfunctional dept. with 20-30 years old schisms between people.)

Institutional Effectiveness—SACS

At TSTC-Harlingen TQM is accomplished through the Institutional Effectiveness initiative.

Some

Formally

Also one-half time Staff Development Director

Personality Inventory Meeting Skills

University Affairs, Development, Graduate School, Registrar’s Office, Police Personnel

By us? I assume you mean by SWT trainers. The numbers you see here will be peoples guesses. I doubt they are meaningful as real percentages, just as perceptions.
(7a) Who knows.
(10) Introduction to Quality, Reasoning Styles.
(10b) These vary.
(15) Whose? Ours? In general?
(16) Unclear what you mean.
(18) You probably mean something specific here, but most people won't catch the distinction.
(19) All people who attend voluntarily. We had 400+ trained.

(6b) Performance evaluations

(3) Associate Provost

>0 but less than 10 for each group.
1. Joiner
2. 7 basic tools
3. Brassard 7 planning and management tools.

(AC) Currently, formal training is outsourced and was provided by the UW System Quality Consultant. A consortium of education and government persons developed the Academy, which has assumed the training formerly provided by the Quality Consultant for the UW system.

(13) Depends on SP target area.

(3) Business and Management Professor

(7) Don't know.
(13) Varies by department.
(AC) Our philosophy is that adults learn in a variety of ways, only one of which is through "training". The thrust of our efforts is to learn through actively applying the concepts, guided by facilitators. The idea of training is integrated into the implementation process.

(1) Not active at this time. Under new leadership at college.
(3) I was the intended Quality Coordinator. (Use to be the 25% of time, but now services are contracted out through our Center for Business and Industry.
(AC) Our internal continuous improvement team (CIT) is now reorganizing and will be made up of all faculty, with our CEO (President) Dr. Robert Ernst as leader. I will continue to represent our president in a trainer and coordinator capacity. The 1994-95 school year has been a limbo year as far as training.

(3) Have had a part-time coordinator the last two years. Waiting for new Quality Improvement Coordinator
(8a) Focus Groups.
(17b) Administrative Services
206

142 (Cont'd.) (AC) We did a lot of training the first two years. I am not anticipating a lot of additional training over the next few years. It is administration's hope that the principles and tools are being incorporated in the way we work.

143 (3) Director of Organizational Development
(6b) Self disclosure.
(10) Others are in the queue for next year.
(12) Proposed for next year.

144 (9) Proctor and Gamble/Florida Power & Light

145 (6b) Annual reports/evaluations, self-assessment descriptions
(13) Optional of employees initiative/request.

146 (3) Individual Faculty member
(4) Note: Those being trained are undergraduate students.
(6b) Performance Data Collection, PDSA cycle of performance improvement.
(8c) Student Outcomes
(9) Quality Function Deployment
(10) PDSA cycle of improvement
(13) For students, yes
(19) For students, yes
(AC) My classes are the focus of research and design conducted by a virtually integrated league of students, faculty, industry employees, industry practitioners and ind., final customers. Our results are transformed into improved education, process content and technology. These are shared nationally throughout our discipline and our industry.

147 (3) Coordinated efforts mainly by the Dean of College of Business and VP for students.
(AC) We have several small efforts in different divisions of the University. I feel a larger coordinated effort would gain significantly more benefit, but we need a high level champion.

148 (16) Now—1, Planned—8

149 (3) Senior VP, Administration
(5a) Scheduled for Jung
(6b) We are doing pilot projects with case studies as evaluation methods.
(7) Since we are using the approach of pilot projects, no desire for institution wide training.
(8a) Will have first formal review in June workshop.
(8c) Cost of Quality depends on area
(9) We have used the Arthur Andersen Corp. for consultants and their quality framework.
(11) Varies widely based on exposure to program.
(12) If in one of the pilot project divisions.
(19) When in their division 100% staged in workplace as a team.

(20) In the sense that in pilot (e.g., Bursar's Office) it is happening to coordinate with change efforts.

(AC) Our approach was to establish one pilot project two years ago; expand to four this year. Goal was to work intensively with entire staff of pilot rather than to have an institution-wide training. In that sense this survey is difficult to respond to for any but affected areas.

150 (3) Director, Human Resources and Quality Improvement

(15) Equal.

151 (9) Team Handbook for Educators

(18) Feedback after each session; participation in agenda setting.

152 (3) It is not an institution wide program. It is among eight administrative units (250 staff)

(12) We don't really have formal performance reviews.

(13) See #12

(14) Moving from external consultants to employees and consultants.

(15) No basis for judgement yet

(17) We are the pilot

(AC) We are just finishing a two-year training process that involved eight administrative offices. We followed a Deming model led by an outside consultant, first learning and practicing Quality in daily work and then cross-functional action teams. We are now trying to institutionalize, analyze, and expand the process.

153 (9) Kahn, Acoff

155 (3) Assistant to the President

(9) Peter Black, the Holy Bible

(13) Just beginning to expect this.

156 (1) Within my department only—100 staff

(8c) Too soon to tell.

(9) USDOL Enterprise Council and Pioneer initiative.

(13) Yet to be determined.

(AC) We are part of the University Community Service Division and are responsible for the JTPA Service and a Business Assistance Center. Response applies only to our programs, not the entire University.

157 (3) Dr. Carolyn Woo, Associate Executive

(9) Motorola
208

158  (9)  Covey
     (10)  Systems thinking, visioning
     (17b)  Cross-functional

159  (3)  Administrative Division Heads
     (6b)  Survey, Customer Focus
     (12)  Performance review not tied to salary
     (AC)  We initially attempted broad awareness training—learning curves varied quite a bit so we’ve varied approach. Good luck.

160  (3)  Executive Vice President

161  (3)  Vice President, Finance and Administration
     (6b)  Informal but people are applying process redesign concepts to selected university projects.

162  (3)  Director of Human Resources.
     (4)  New program, some staff development over past three years. (Not structured at this point).
     (7a)  Some limited at professional Assoc. Meetings
     (7g)  Will be trained this summer.

163  (2)  Varies by unit/area

164  (6b)  Self, peer, and supervisor’s perceptions—performance standards.
     (17b)  Computing Services and Health Center Academy, Advising Admissions, Financial Aid.

165  (9)  Joel Barker on Paradigms; Meg Wheatley on Chaos.
     (17)  Support staff

166  (3)  Business Division Chair

168  (3)  Quality Manager
     (13)  Being used more as a tool to drive improvement by management.
     (AC)  Iowa state is partnering with Texas Instruments.
         - TI has provided significant training resources to ISU.
         - Co-develop and Co-deliver courses
         - Cooperative outreach
         Your persistence has paid off! Sorry for such slow response.

169  (3)  College Development

170  (3)  Quality Coordinator

171  (6b)  We publish application examples
     (AC)  We have various types of customized training for faculty, staff and administrator in addition to a 36-hour 2 credit course that began in 1988.
Total Quality Leadership Team
(6b) Climate Surveys, Customer Satisfaction Surveys, audits.
(8c) Number of Meetings
(14) With occasional outsiders

All employees
(8c) Perception
(9) Crosby—originally
(17b) Administration, Faculty, and Staff Union Leaders

Connie O.C.
(6b) Culture Survey 1991 and 1994
(12) That's part of the problem faculty won't leave classroom to attend training.
(AC) Voluntary training is not working with faculty.

Director of Student Services
(8c) Cost of Quality—didn't know how you mean the term, may have answered backwards.

TQ Specialist, Just started 5 weeks ago, replacing the previous coordinator.
(4) Have not yet evaluated the entire program, only each class.
(5a) I have not
(11a,c) Don't know
(12) Don't know
(13) Don't know
(16) Working on developing this.
(AC) Redesign of quality training program is now in process. Last two years efforts focused on background and introduction. Redesign of courses will focus on partial application of using concepts, tools, and techniques on the job. Want to get rid of the "TQ" moniker and make this job "the way" we do our jobs—a regular part of our daily efforts.

Although many of the things we did previously were very similar.
(3) Quality is everyone's responsibility. The Dean holds department heads responsible.
(4) 2-day faculty workshops on applying TQ concepts to education.
(6b) Current programs for unit self-assessment and institutional inventories and surveys are providing baseline data concerning academic practice and faculty attitudes.
(8a) On-going organizational climate survey has been used for last 8 years.
(8b) Gradual improvement over last 5 years.
(10) Varied across functions, programs and departments.
(13) Teaching portfolios are widely used.
(15) Educational programs consultants such as Peter Ewell, Jim Nichols, Cyndi Lynch have been very helpful but didn't provide quality training per se.
Education is our most important process, that's where we started.

We've worked to integrate quality improvement perceptive and techniques into our normal way of doing things. This survey seems to assume quality is understood as a separate and distinct program. My guess is that this is one of the reasons quality initiatives are encountering so much resistance.

Initially extensive campus-wide training. Now people are integrated through their specific teams. Currently, setting up an in-house facilitator training for fall.

In our division training is mandatory for all FTE. Not specifically, but it's assumed staff are using this skills.

Mostly our own for staff and outside consultants for upper administration in our division.

Our trainers are mostly supervisors.

Maintenance is in division of administration and finance.

Assess every 2 years.

We are still working on these.

Covey Training.

With a few consultants.

Before MPTC started our Quality program, everyone was well advised of it; and our people who were going to do the training were well trained prior to conducting any Quality Courses.

Culture study, employee evaluation, customer feedback.

Covey

Still being developed

In different years

Depends on year

Wish our institution was doing more to train staff and had some plan to implement and measure its effectiveness.
New institution-wide program this fall. MSU programs began in a division—no overall program until just recently.

Training coordinators

We've only just began by introducing culture change and some process improvement.

Others listed are part of the quality training overview and orientation to begin this fall—facilitated by the National Quality Academy in a train-the-trainers program.

Will be in the future.

Will be in the future.

No comparison yet. Our employees will begin this fall.

Quality programs were begun in physical plant and student affairs.

The VP of Student Affairs began a quality initiative in his division approximately four years ago. A consultant was hired to train all divisional employees in quality concepts. This was not supported by the President or others in Administration. The physical plant (University Operations) VP later became active to pursue some quality behaviors, no formal program, and also isolated in that division. New president brought in workshops and culture change and process improvement two years ago. Efforts now this fall will bring in a formal program for all University staff, more comprehensive then in the past, to be facilitated by the National Quality Academy in a train-the-trainers session in August—a more consolidated effort.

Involvement in self-management and improvement teams.

2 required Quality days required for faculty

CQI Coordinator.

It will be in the next 2 years.

New attitude: Prof. as manager of Ed. Processes

Same people.

Perhaps will be soon

NA: We use our own trainers (i.e., me)

We are attempting to implement TQ in our College of Engineering only. All my answers to your instrument relate only to the College of Engineering...not to the university as a whole.
(8a) Climate Survey
(8c) Cost of Quality—while on the learning curve.
(12) Will be included in all performance reviews beginning in July 95, before it was hit and miss.
(13) Will be across the board with comments above.
(14) Plus occasional speakers

(3) Total Quality Education Programs Coordinator.
(AC) I feel that the greatest barriers to the success of CQI on our campus is the lack of support from administration and that Quality improvement does not play a part in performance appraisals. Unfortunately extrinsic motivators are necessary in the early stages of implementation.

(3) All employees
(8c) Don’t know for sure.
(11) Varies from 1 to 10 depending on individual.

(3) Vice-Chancellor, Financial
(6b) Not evaluated
(AC) College and its 3 campuses have undergone major restriction over past 2-3 years. Many key positions have new faces in new chairs with different responsibilities. Too many and too rapid culture changes mixed with confusion and skepticism. A re-start or second attempt is underway. Press on! The board gives the impression of not having an “equality position” in CQI.

(3) Coordinator, Quality Resource Center
(6b) Classroom procedures, direction of school of Business.
(12) Is one factor considered in general service.
(13) In a general service.
(21) Self supporting profits from semesters.
(AC) I answered for school of business only.

(3) We are so deeply involved that a wide variety of administrators and faculty are involved. President is personally and deeply committed.
(6b) Employee surveys, program services, etc.
(7) Not a single curriculum—numerous talents.
(9) Baldrige Criteria—will seek Ed. Baldrige

(3) Our President has formed a Culture of Quality, Steering Committee. We have used the Baldrige Criteria as a template in our planning and implementation process not “training” person.
(7) Those knowing the processes for achieving quality initiatives are represented.

(1) However, we have not been consistent with our efforts. The training has been focused on administrators to this point.
Voluntary at this stage!
We are in the very early stages of evaluation and implementation—stops and starts have characterized our efforts to date!

Director—Institutional Research and Planning
Covey—for individuals
Personal effectiveness
We depend on our follow up workshops: personal effectiveness, improving learning in the classroom, team work improvement, and leadership improvement.

Quality Improvement Coordinator
Quality initiatives have not been implemented from top down—efforts have been focused on selected administrative areas and training has been offered only to those employees whose directors or managers have expressed interest and commitment to quality improvement.

Vice Chancellor for Planning/Improvement
This question is not clear.
Only a small group of CIs have been trained—those in student enrollment services. For this questionnaire there's a mixture of questions, some of which pertain to the entire university, others of which seemed best answered for the small group. I may have misunderstood which was which. It's the weakness of many questionnaires designed to assess local implementation efforts.

Asst V.P. for Academic Affairs
See attached baseline information. This information is broader than just training, but training is incorporated into it.
Approximately 5,000 of the 10,000 employees have received some training.
Greenleaf, Covey
It is beginning to be.

We have a CQI committee
We have used several training programs; there is no single program.
My responses represent a global assessment of all the training efforts used.
We have not specifically assessed these.
Benchmarking

In certain non-academic areas.
Rough, we are still not going at it hard.
I have worked with some in Business and Financial Service "side".
Certain small areas, like a study in Business Administration Bldg.
Waste; we have a lot (all colleges and universities do). Many no value added activities.
Again we only do a part here or there, as a statistician I believe in Deming and Ishikawa.

This answer depends upon which group you are talking to. For NIS students in Quality Management we use Advanced Stat. Tech., for others (customers) we talk about Q culture.

In certain areas

Depends on which area (this is a big University). Not evaluating faculty.

However I believe in using internal people. Most external consultants are a waste.

In certain (small no's) areas, we use this after a few have gone to outside programs.

Again restricted number of areas.

We are doing this now in physical plant.

We could not get it in the college of liberal arts. (Business college is "thinking" about it.)

Very infrequent.

Obviously Iowa has not gone into this much. Maybe a new president who believes will help. The Vice Pres. for Business and Financial Services is the highest ranking official that believes and that is why we have tried a little on that side. NOTE: Our president who is leaving July 1 does not believe and so it has been difficult to get anything serious going, a little on nonacademic side like Physical Plant.

On an area-by-area basis (see attached history)

Administrative Services has a full time Quality Coordinator—Director, Quality Support.

We have a climate survey but are not tying attitude change to training in particular.

Unknown

In Administrative Services only

Flowcharts, Measurement, Focus Groups

Consensus, false consensus, meeting management, personality types, communication, stages of group development.

I have enclosed a short summary of our quality improvement efforts here at Weber. Since the effort is not a University initiative most of my comments are from my perspective as Quality Coordinator for the Administrative Services Division.

Director

Participation in the Quality Action Teams.

Self-developed by a former Coordinator of Quality.

4 pilot Classrooms.

For high level managers.

From now on.

We have our own TQM experts.

U.M. is extremely advanced in implementing TQM in certain academic areas.
During active years of program.
When we had quality program.
When we had program.
We had a quality program several years. When a new president came 2 years ago this has not been continued. Please understand that our program is not active now.
No release time.
We have just started, and we do not have data on much of what you are looking for.
Employees.
As above.
We recognize there is much more to be accomplished. Our efforts have laid a good foundation. Nonetheless a continuing focus on quality improvement should result in additional benefits.
<table>
<thead>
<tr>
<th>NO.</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>As you can see by the enclosed survey, I started to complete it in the affirmative based on what I know is taking place informally as the result of an excellent, formal two-year program established and operated by the College’s former Vice President for Business and College Services. CPCC does much with CQI informally now, as the College moves more toward becoming a learning organization, I believe CQI will, again, have a formal role in College development. Moving through your survey, however, it became apparent I would need to change my initial answer to “no” and return the survey “unanswered”.</td>
</tr>
<tr>
<td>004</td>
<td>Since we have not implemented a University program.</td>
</tr>
<tr>
<td>007</td>
<td>We have had an assessment program for 20 years which has resulted in significant institutional improvements. However it is not organized like a TQM TQI-type program.</td>
</tr>
<tr>
<td>008</td>
<td>Campus-wide effort under development as part of strategic planning process. Sporadic training efforts have been offered (improving Customer Service) through Campus Human Resources. Other training efforts have been spotty to date.</td>
</tr>
<tr>
<td>011</td>
<td>Have had in the past. Mounting a new program in 1995-96.</td>
</tr>
<tr>
<td>017</td>
<td>We have an excellent academic program (master’s degree) however, the administration is not interested in a formal program. The faculty in the Quality Program applies quality principles in the development and delivery of the program. The program is well recognized and accepted in industry and has experienced exceptional growth. You should investigate successful applications, such as this, which are driven by faculty: rather than “Quick “PR” scams).</td>
</tr>
<tr>
<td>019</td>
<td>We emphasize institutional effectiveness—not quality.</td>
</tr>
<tr>
<td>021</td>
<td>Macomb has been very active in Assessment and Institutional Effectiveness efforts, but not in TQM or CQI.</td>
</tr>
<tr>
<td>021</td>
<td>We do not have a formal quality improvement program. We do have a course in quality methods.</td>
</tr>
<tr>
<td>022</td>
<td>No employee training. We have a new President who may make changes in this area.</td>
</tr>
</tbody>
</table>
The college is currently defining its formal quality initiative. Much training has been done over the years, but nothing is designated a quality improvement process in a formal way. One of my job responsibilities is to assist the college with defining its quality initiative. We have just begun.

Budget cuts eliminated a formal CQI initiative before it had a chance to have any meaningful impact.

Use TQM in classrooms. Students projects at a MBA level.

A few isolated efforts is the extent of it. We do teach the subject in Business and Engineering.

Individual departments have used quality improvement programs but we have no campus-wide effort.

We had a quality program several years. When a new president came two years ago this has not been continued.

We have no systematic program. We occasionally run classes.

No formal effort for the institution as a whole. A few individuals and units are doing their own thing to implement QI.

Only in pockets—i.e. some units or subunits of the university.

We are still in an exploratory stage of looking at QI.

We do have a few areas within the university working with quality strategies, but no overall program.

We did in the past—trained people in the physical plant, the business school and the hospital. We are doing re-engineering now.

We have a strong two-year associate degree program in Quality Engineering Technology. The local industry is about 50-50 manufacturing: service.

New president in August 1993, ended TQM initiatives.

We have had a program, but funding was terminated last year.

We are just starting up this initiative. We would have more to say a year from now.

Not formally.
We have just completed an exhaustive two-year-long self-study as part of our Middle States reaccreditation process. Every constituency on campus has considerable input into self-criticism and suggestions for improvement. On top of this major effort, we have begun our third, 5-year cycle of strategic planning which, again, identifies goals and obstacles. Our president is acutely aware of TQM, but we consider our present operation to be a system of continuous improvement.

Rider has received training assistance from a corporation but does not conduct its own training program. Therefore most of this survey is not directly applicable to our situation.

Ambassador does not conduct on-going training programs on TQM or QI; however several elements of the theory of TQM have crept into our every day practices.

We have no quality program. I use it in my classroom.

Stanford terminated all coordinated TQM-like efforts over a year ago.

The question is really not applicable for us. We are just now investigating possible involvement with quality principles.

Our efforts in TQM are in the embryonic stages and responses to the survey at this time would not be very useful.

We are not actually engaged in a quality process at U Mass, Boston.

The Cox School of Business did some quality work on curriculum. Not much is happening at the University level.

This is in the process of change at the moment; and therefore, the data is inaccurate when I try to respond to your questions. In another couple of months we could try again if you'd like.
REFERENCES


