A MEASURE OF PARTICIPANT PERCEPTIONS ABOUT THE BENEFITS OF QUALITY CIRCLE INVOLVEMENT

By

GEORGE DEXTER GRAHAM

Bachelor of Arts

Oklahoma City University

Oklahoma City, Oklahoma

1982

Submitted to the Faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the degree of
MASTER OF SCIENCE
December 1986

A MEASURE OF PARTICIPANT PERCEPTIONS

ABOUT THE BENEFITS OF QUALITY

CIRCLE INVOLVEMENT

Thesis Approved:

William L. Kennedy
Thesis Adviser

John L. Burd

Jerry L. Davis

Norman N. Durham
Dean of the Graduate College

ACKNOWLEDGMENTS

Appreciation and sincere gratitude are extended to everyone who stood by and encouraged me in this study.

A special expression of thanks goes to Dr. William Venable, my major advisor, for his professional interest, patience and guidance. Sincere appreciation is also extended to Drs. Baird and Davis for their assistance as committee members.

My sincerest thanks go to my friends and co-workers for their positive support, ideas and reassurance during this research; and to all the quality circle facilitators, leaders, and members at the Mike Monroney Aeronautical Center who participated in this research study.

To my family, which is responsible for where I am today, I would like to express my gratitude for believing in me.

My deepest appreciation is expressed to my wife and three children for their patience, encouragement, consideration, perseverance, sacrifice and understanding.

Without these people, this study would have been next to impossible.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

One of the most popular organizational development techniques available today is the quality circle. This concept has aroused the interest of American industry primarily because of the industrial success Japan has had utilizing this participative approach within its work force. A quality circle is a small group of approximately 10 employees who voluntarily meet, after receiving special training, to identify, analyze, and resolve work related problems. They develop the appropriate solution to a problem and after gaining managerial approval are instrumental in the implementation process (Lloyd and Rehq, 1982). Benefits from quality circles fall into two broad categories, the improvement of the attitudes and behavior of workers, and measurable savings.

Nelson (1980) refers to testimonials of savings from ideas suggested by members of quality circles:

-The purchasing department of Westinghouse Electronics Systems Center, Baltimore, Maryland saved $636,000 by eliminating the costs incurred by vendor overshipments.

-Quality circles at Honeywell, St. Petersburg, Florida, helped reduce product costs by $500,000.

-Quality circles at Lockheed saved $3,000 per year by installing travel-dial indicators on four machine tools, improving product quality and machine efficiency.

-Quality circles at Westinghouse saved $14,000 yearly by developing a materials identification chart to assist Inductive Components Department assemblers in verifying process specifications.

Management often requires dollar savings as justification for implementing quality circles without giving proper consideration to the positive effects on attitudes and/or communication. The success stories about quality circles have influenced many American managers to become involved while others have heard reports of miserable failures and dismissed the concept as just another managerial fad.

The Department of Defense (DOD) has been reported to have as many as 1000 quality circles (Steele, Ovalle, and Lloyd, 1982). Unfortunately, very little research has been conducted on quality circles and not until recently have there been any published efforts to determine their impact on various attitudinal and behavioral criteria. Fortunately, the DOD is on the frontier of this scientific effort and is led by a group of researchers at the Air Force Institute of Technology. Research information is collected using scientific means which allows for a conclusion about quality circles with more confidence than is possible with personal testimonies (Steele, Ovalle, Lloyd and Hendrix, 1982).

Problem Statement

The absence of research about attitudinal perceptions of employee participants in quality circles is a problem. Systematic research on the quality circle as a process has been strikingly absent even though there continues to be widespread initiation of quality circles throughout the United States. Research is needed to learn more concerning participant perceptions about quality circles.

Purpose of the Study

The purpose of this study was to analyze quality circle member perceptions about self-report measures of qualitative attributes, productivity, improved organizational communication, job involvement, teamwork, leadership, participation, and human relationships. These measures were the premises for the questions of the study and for the areas which the questionnaire was designed to address.

Research Questions

From the review of literature, variables were identified that were believed to be affected by participation in a quality circle program. This study examined informal relationships between certain job perceptions and attitudes of participants in quality circles which have been in operation for from one to five years.

A pattern of positive responses to these variables may

have indicated an influence upon items of interest and concern to managers. A positive response could also have indicated that intangible benefits were being received by participants of quality circles, as predicted by the International Association of Quality Circles. The following questions identify the perceptions of the participants about the research areas addressed by the questionnaire.

Question 1--Does involvement in a quality circle program contribute to qualitative attributes?

Question 2--Does involvement in a quality circle program contribute to productivity?

Question 3--Does involvement in a quality circle program contribute to organizational communication?

Question 4--Does involvement in a quality circle program contribute to job involvement?

Question 5--Does involvement in a quality circle program contribute to organizational employee teamwork?

Question 6--Does involvement in a quality circle program contribute to leadership development?

Question 7--Does involvement in a quality circle program contribute to participation by the employees?

Question 8--Does involvement in a quality circle program contribute to human relationships?

Limitations

1. Only employees who were already in the quality circle program and working at the installation under study

participated.

2. No data were collected concerning monetary savings as a result of involvement in quality circles.

3. The questionnaire was designed to gather data concerning only eight behavioral attitudes.

4. Non-attitudinal measures of quality circle outcomes were not measured.

5. Data were compared to reports, research findings, and other sources from authorities in the field of quality circles.

6. The titles used in the eight respondent perception areas are not as descriptive as they might be causing awkwardness in relating to the definition.

Assumptions

1. There was no significant difference between quality circle groups with varying job skills or areas of work activity.

2. The Quality Circle member questionnaire was an appropriate instrument for collecting measures of attitudinal perceptions about qualitative attributes, productivity, organizational communication, job involvement, teamwork, leadership, participation, and human relationships, by members of the quality circle program at the Mike Monroney Aeronautical Center of the Federal Aviation Administration.

3. The criteria selected for analysis address the major attitudinal areas identified by research in the field

of quality circles.

4. The questionnaire gathered information sensitive to the effects of the quality circle process.

5. The groups from which the data were collected have utilized quality circle problem solving and decision making tools.

Definition of Terms

The following terms are defined as they are intended to be understood for the purposes of this study and within the context of participant involvement in or commitment to the quality circle.

Human relationships--attitudes expressed by management and employees toward each other and the activities each are involved in. They may be expressed by the supportiveness of the facilitator, lack of criticism toward fellow employees, and an increase in supervisor efficiency resulting in a cooperative atmosphere.

Job involvement--a function of voluntarily participating in decision making groups working on improvements in the work process. This function helps eliminate criticism and works to create an enjoyable work atmosphere of cooperativeness to bring about pride in the work produced.

Job satisfaction--a function of the perceived relationship between what one wants from his job and what one perceives that it offers.

Leadership--the strength of attraction associated with

participating in decisions that affect the job by performing in leader roles, making presentations on circle projects and gaining recognition for circle accomplishments.

Organizational commitment--relative strength of an individual's identification with and involvement in a particular organization, promoting personal and leadership development.

Organizational communication--involvement by employees in presentations, leader and facilitator commitment, working relationships, information exchange between shifts and communication with management.

Participation--involvement by workers in problem-solving, decision-making, and implementation of solutions.

Perception--the process by which individuals attach meaning to their experience in relation to the development of a harmonious manager/worker relationship.

Productivity--level of employee performance enhanced by commitment to voluntary participation in meetings and group problem solving, demonstration of a positive work attitude, pride in work and a feeling of enjoyment or satisfaction from the job.

Product quality--a reduction in errors and pride in the quality of items produced.

Qualitative attributes--efforts contributing to the reduction of workplace errors and increase in output quality due to the quality of workmanship and pride in work

performance.

Respondent perception area--an area identified by the panel of experts for the purpose of collecting perception data relating to quality circle involvement.

Teamwork--relative strength of an individual's identification with job involvement by finding and supporting ways to make himself and his co-workers more productive.

Organization of the Study

Chapter I introduces the study by presenting the problem, the purpose of the study, research questions to be addressed, limitations, assumptions and definition of terms. Chapter II includes a review of literature concerning the introduction of the quality circle concept and how it was developed in Japan, how it came to America, the structure of the quality circle, the training involved and the results that can be expected. Chapter III reports the procedures utilized in the study, including the selection of subjects, the data gathering instrument, the support for the study, the collection of data and analysis of the data. Chapter IV presents the findings of the study. Chapter V contains the summary, conclusions and recommendations for further use and research.

CHAPTER II

REVIEW OF LITERATURE

Introduction

This chapter reviews the literature about quality circle. Although there are some minor differences in the way various sources describe quality circles, the following represents the general consensus concerning a quality circle and its purpose. A quality circle is a relatively autonomous unit composed of a group of approximately ten workers led by a foreman or senior worker and organized within each work unit. Participants are taught elementary techniques of problem solving, including statistical methods. It is in principle a voluntary study group that concentrates on solving job-related quality problems. These problems are addressed in order to improve methods of production as part of company-wide efforts. At the same time, the circles focus on improving working conditions and self development of the workers. Above all, the circles involve recognition that hourly workers have an important contribution to make to the organization (Cole, 1980).

The role of quality circles has expanded beyond dealing only with quality problems. In a recent article, Dailey and

Kagerer (1982, p. 40) stated, ". . . the problems addressed are not restricted to quality but may be in any area that influences, directly or indirectly, the output of the work unit." World renowned quality circle theorist Dr. Joseph Juran (1980) states:

> the main effect of the QC circle movement is utilization of the education, experience, and creativity of the workforce to aid in improving company performance. This improvement is not restricted to quality (p. 22).

A quality circle effort may result in: improved morale; greater loyalty to the organization; increased sense of teamwork among participants; improved overall organizational productivity; improved product or service quality; reduction in absenteeism, grievances, and tardiness; and solution to problems that save the organization money (Thompson, 1982).

Managers play a crucial role in the implementation and effectiveness of a quality circle program. Active management support and involvement are fundamental ingredients for success (Sikes, Connell, and Donovan, 1980).

This review of literature will attempt to study the topics of the development of the quality circle in Japan, quality circle training, and the benefits of quality circles.

Development of Quality Circles in Japan

The concept called quality circles evolved in Japan as

a combination of U.S. statistical quality control practices and innovations by the Japanese. Following WWII, the industrial leaders of Japan began to realize the future of their country would depend on how competitively they produced their goods. They undertook an effort to revolutionize the quality of their products in an attempt to make their goods saleable in the world market (Juran 1981).

The leading role in bringing about this desire in Japan was played by a powerful trade organization called the Japanese Scientists and Engineers (JUSE). The JUSE organized a quality control research group in 1949 and invited American statisticians, notably Dr. W. Edwards Deming, to Japan in 1950 to teach a seminar on American standards to a group of Japanese Engineers and statisticians. After Dr. Deming's lectures the Japanese began developing their own quality control methods. These techniques comprise the basic analytical tools used in quality circles today (Dewar, 1980).

Massive training programs were started (Juran, 1980) aimed at training everyone from the top to the rank-and-file employees in statistical quality control concepts. In an effort to reach the large number of foremen in the country the Japanese broadcast a training course on national television and sold copies of the broadcast text at the newsstands.

The first quality circle in Japan was started in 1962. Today there are more than 100,000 quality circles

registered with JUSE and an additional 1 million unregistered (Ouchi, 1981).

Quality Circles in America

The first quality circle in this country was considered to be the one started by Lockheed Missile and Space Company in 1974. Several reasons for the early development of quality circles in a high technology and aerospace company have been suggested. There was already an emphasis on the quality of the product, and cooperation between labor and management was well-founded. Much of the workplace labor was performed in groups, and many of the components produced were unique, allowing work groups to develop their own routines. Because of the reported success at Lockheed the number of companies involving themselves in quality circles began to multiply rapidly. As a result of this growth, a new organization, the International Association of Quality Circles (IAQC) was formed in 1978 by two former employees of Lockheed. In its August 1982 publication, the IAQC estimated its membership at 5,000 members and more than 50 local chapters (Riley, 1982).

The quality circle concept gained in popularity following the 1980 drop in U.S. automobile sales which was thought to be caused by competition from the Japanese who were producing a higher quality product (Yager, 1980). The continued economic success by Japan has caused the American interest in quality circles to grow. The spread of quality

circle programs throughout industry in America is unparalleled by any other organizational improvement program (Blair, Cohen, and Hurwitz, 1982). Today quality circles are considered a viable part of Honeywell, Ford Motor Company, General Motors, Westinghouse, the U.S. Air Force, and the U.S. Navy.

Quality Circle Structure

A quality circle is an integrated system composed of the following levels of participation: circle members, a circle leader (foreman), facilitator (program coordinator), and a steering committee (Dewar, 1979). The size of the circle is usually limited to between three and fifteen, preferably maintained between five and ten (Lloyd and Rehq, 1982).

The circle members are usually individuals from the same work area, doing similar work, so the problems they select will normally be familiar to all of them (Dewar, 1979). They receive specially designed training in the techniques of management presentations and the tools of problem solving.

A circle leader is responsible for the smooth and effective operation of the circle. The circle has more potential for success when the leader is a supervisor. Leaders may vary in the amount of support they require from the facilitator, but the need for this support will normally diminish over time. The leader should endeavor to

involve each circle member as many times as possible at every meeting through questions and opinion seeking (Dewar, 1979).

The facilitator is responsible for coordinating and directing quality circle activities within the organization. He should be able to communicate with all levels of management as well as employees "on the floor". His duties include working closely with the steering committee and forming a link between the circles and the rest of the organization. The facilitator is also responsible for circle leader training (Dewar, 1979).

The steering committee should be made up of the major department heads of the company as well as top level staff people. A representative of the union, if there is one, is also desirable. Participation in the steering committee meetings is just as important as circle level participation. The ideal size for the steering committee is seven or eight and should not normally exceed fifteen. The chairman should be selected from among the members using a democratic process, one person, one vote. Duties involve setting goals and objectives for quality circle activities and establishing guidelines for circle operation and program expansion (Dewar, 1979).

Circle members seek to improve productivity, reduce costs, improve working conditions and improve product quality (Cole, 1980). Meetings are usually held weekly, on company time, and in an area removed from the normal work

place (Thompson, 1982). After a solution is found to a problem, management is informed through a presentation by the circle along with an assessment of associated costs and benefits. Management then accepts, rejects, or modifies the proposal. The implementation process is usually a joint effort between the circle members and management. The cycle is then repeated with the identification of another problem. Circles continue as long as the group desires to participate. They can declare themselves inactive, disband the group totally, and/or reactivate it at any time they desire (Thompson, 1982). The quality circle concept provides an opportunity for everyone to join, refuse to join, postpone joining, quit, and/or rejoin (Thompson, 1982).

Quality Circle Training

One of the key elements of quality circles is the training they are provided by their facilitator. Training for the circle leaders involves instruction in how to function as a coach, coordinator, and trainer. The tools for problem-solving and presentation techniques are given to the circle members. Training areas include group dynamics, motivation, problem solving, brainstorming, cause and effect analysis, data gathering, the histogram, the pareto diagram, and the presentation.

Group dynamics--The idea of a group implies mutual influence, interaction among people, and a degree of inter-

dependence. Work performance and attitudes on the job can be influenced by the work group. The leader is trained to conduct meetings in such a way that decisions are reached more by consensus than by majority (Dewar, 1980).

Motivation--This training demonstrates how quality circles can contribute to leadership, communication, and self-motivation. Several barriers to communication are described and applied to conducting problem-solving discussions (Dewar, 1980).

Problem-solving--This segment of the training is usually provided to the circle members by the circle leader, although the facilitator sometimes provides the training.

Brainstorming--This tool brings everyone's ideas into the open in order to assemble a list of potential projects. It is utilized through the quality circle process to collect and evaluate problems (Dewar, 1980).

Cause and Effect Analysis--This is a graphic way of stating the problem and then brainstorming for the reasons the problem exists. Such analysis involves the use of three elements. They are:

--cause classification--categorizing the area from which the problem arises.

--process analysis--identifying the process contributing to the problem.

--cause analysis--researching each identified cause to determine the validity of its contribution to the

problem (Dewar, 1979). Data gathering--In order for the group to make complete analysis of a problem it has identified it is sometimes required to collect data. Techniques are taught to assure accuracy of decisions and to save time (Dewar, 1980).

Histogram--This chart, depicting historical data in graphic form, is taught to help the circles show the proper distribution of data in terms of frequency of occurrence of specific data. Circles are taught to build and interpret the meaning of variously shaped histograms (Dewar, 1980).

Pareto diagram--The development of this diagram is a graphic way of summarizing data to highlight the main contributors of a concern. The diagram is designed to depict the problems identified in descending order of importance from left to right (Dewar, 1980).

Presentation--This tool is used to make recommendations or provide status to the managers. Basic public speaking is also a segment of this training (Dewar, 1980).

Benefits of Quality Circles

Significant dollar savings have been reported as a result of implementing quality circles. Westinghouse Defense and Electronics Systems Center reported $52,000 in savings (Comstock and Swartz, 1979). There were $200,000 reported from the Norfolk Naval Shipyard (Bryant and Kearns, 1981). Honeywell reported several million dollars saved as a result of its quality circle efforts (Kanarick,

1981). The reported success is not only in the U.S., because billions of dollars were saved through thousands of improvement projects in Japan which would never have been possible without quality circles (Juran, 1980).

There are also many organizations attributing other benefit gains such as reduced absenteeism (Patchin, 1981), improved morale, improved motivation, and improved job satisfaction (Bryant and Kearnes, 1981) to the implementation of quality circles. Honeywell has obtained data reflecting significant cost reductions, machine utilization improvements and shortened learning curves as a result of quality circles (Donovan and VanHorn, 1980). Initial results of the Martin Marietta Aerospace Michoud Division quality circle effectiveness showed improvement in job attitudes, accident rates, grievance rates, and defect rates.

Participation in quality circles has had a marked effect on employee attitudes toward themselves, their coworkers, and supervisors and has provided an opportunity for personal growth and development within the organization. This type of psychological climate suggested by positive employee attitudes results in the growth and success of a company in a competitive market (Tortorich et al, 1981).

CHAPTER III

METHODOLOGY

This chapter details the procedures for collecting data concerning quality circle member perceptions related to their work environment as well as data concerning the positive benefits they personally received through participating in quality circles. The purpose of the research was to determine whether positive or negative benefits could be identified from self report measures of 1) qualitative attributes, 2) productivity, 3) organizational communication, 4) job involvement, 5) teamwork, 6) leadership, 7) participation, and 8) human relationships, as seen through the eyes of the quality circle members. This chapter includes the population and sample, data gathering instrument, support for the study, collection of the data, and the procedures selected for analyzing the data.

Population and Sample

Criteria were established for the selection of quality circle member subjects of the Federal Aviation Administration as a target population for this study. The organizations chosen were from the Mike Monroney Aeronautical Center in Oklahoma City, Oklahoma. The survey population

departments selected at the center were the Airman and Aircraft Registry.

These two departments have a total of seven quality circles. Three of the quality circles were in the Airman division with 25 members total. Four of the quality circles were in the Aircraft division with 26 members total. The seven quality circles represent all the quality circles within the Federal Aviation Administration. Membership in the Airman Division ranged from 12 in the Super Circle to four in the ABC Quality Circle. Membership in the Aircraft Division ranged from nine in the Brass Tacks Quality Circle to three in the Arras Quality Circle.

The study population included all quality circle participants who were actively involved in the quality circle process and who were employees of the Federal Aviation Administration. The participants were limited to the Mike Monroney Aeronautical Center at Oklahoma City, Oklahoma since the Airman and Aircraft Registry personnel are the only FAA employees involved in the quality circle process.

The study population included voluntary participants only. The quality circle members participating in this study were all graduates of a quality circle class, having received instructions in the quality circle processes and having experienced involvement personally as contributors to the problem solving tools and techniques. There was no distinction made between groups with different job skills or areas of work activity.

The participants were members of quality circles which have accumulated from one to five years of experience. This population includes 51 quality circle members, each of whom was provided an opportunity to participate in the study. Forty-six quality circle members were given a 26 item questionnaire with directions provided by the department quality circle facilitator.

Data Gathering Instrument

A questionnaire was developed for the specific purpose of determining whether the quality circle members active in the field perceived they were receiving the same benefits from their involvement in quality circles as promoters of this concept said was the case.

Validity

The questionnaire was developed through the use of several brainstorm sessions with a panel of experts in the field. These experts were three quality circle coordinators and four quality circle facilitators working for the Air Force, and two quality circle coordinators at the Federal Aviation Administration. These persons were involved in research about the quality circle process on a continuous basis as part of their employment responsibilities. They investigated all aspects of the quality circle concept to determine whether management should support this process in their respective organizations and

departments.

All members of this panel have completed instructor training for quality circle leaders and facilitators. They have experienced the establishment of the initial quality circles within their departments and have trained more than 500 quality circle leaders and members. They have been involved in training the quality circle leaders for their organizations and presently provide facilitator support to quality circles within their departments. Each of them has more than five years of experience with the quality circle process.

The panel of experts brainstormed for objectives supported by the quality circle process, using knowledge gained through a comprehensive review of pertinent literature and through personal participation at various levels of the quality circle process.

The research objectives resulted from several group discussions to assure that as many clear and distinct areas were identified as possible. After all known objectives were listed and a critical review completed, eight research objectives were identified to be addressed by the questionnaire. (See Table I.)

The research objectives focused upon respondent perceptions of the quality circles in the organization in general and some possible effects upon the respondent himself as related to: 1) quality attributes, 2) productivity, 3) organizational communication, 4) job ininvolvement,

TABLE I

QUALITY CIRCLE MEMBER RESPONDENT PERCEPTION AREA MATRIX

RESPONDENT PERCEPTION AREA	QUESTIONS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1. Qualitative attributes								x																	x	
2. Productivity		x	x		x				x										x		x		x	x	x	x
3. Organizational communications				x			x							x	x	x		x								
4. Job Involvement		x			x							x					x		x		x	x			x	
5. Teamwork			x	x									x				x	x			x	x	x		x	
6. Leadership											x			x			x							x		
7. Participation															x		x	x								
8. Human relationships							x				x					x				x		x	x			x

5) teamwork, 6) leadership, 7) participation, and 8) human relationships.

Reliability

The research questions were identified by the contributing panel of experts, covering all known aspects of the program by considering what benefits should be provided to the organization, each department and its managers, and the employees within the departments. The panel developed and refined questions which related to each research area. Each question was reviewed for relevancy, studied to be sure it was phrased properly and stated as simply and directly as possible. Questions were studied for appropriate terminology. All questions were designed to draw out the opinions of the participant. Care was taken to avoid ambiguous, vague, loaded or leading questions.

Each instrument question was assigned to the appropriate respondent perception area or objective based on its relevance as shown in the Quality Circle Member Objective Matrix. (See Table I.) Each question was assigned to all the respondent perception areas to which it could contribute predictable response data for analysis. Some questions were assigned to only one respondent perception area or objective while others were assigned to as many as four or five.

The panel decided a seven point Lickert Scale would provide the respondents a wide choice and better response

accuracy for research data analysis. (See Table II.)

TABLE II

LIMITS OF SCALE

1	2	3	4	5	6	7
Definitely Disagree (DD)	Moderately Disagree (MD)	Inclined to Disagree (ID)	Neither Agree Nor Disagree (N/A)	Inclined to Agree (IA)	Moderately Agree (MA)	Definitely Agree (DA)

The instrument contained 25 questions in a seven point scale ranging from definite disagreement to definite agreement, with a mid point of neither disagreement nor agreement which might also be used as "not applicable". Blocks two and three provided a measure for the respondent to identify his level of disagreement in lesser extremes. Blocks five and six provided a measure for the respondent to identify the level of agreement in lesser extremes.

Question 26 asked the respondent to add any comments he wished to make about his involvement in quality circles. It was not used in the analysis process and did not affect the data tabulations.

The questionnaire was pretested with a group of eight

quality circle members in the Department of the Air Force. The volunteers were interviewed to identify problem areas in the questionnaire. Revisions were made during additional sessions with the work group. After corrections were made and problems resolved, the final copy was prepared and reviewed by two FAA quality circle facilitators.

Support for the Study

A meeting was scheduled with the facilitators of the quality circle program at the Mike Monroney Aeronautical Center. Permission was granted to do the study with their quality circle program subject to management approval. A letter was written requesting management approval. (See Appendix C.) A meeting was scheduled with the program facilitators to discuss the most effective way to conduct the study.

The procedure for which there was agreement involved the development of questionnaire packages for each of the seven quality circle groups. Each package included a folder with instructions for administration of the questionnaire which was used by the facilitator, together with a complete questionnaire for each member of the quality circles participating in the study. (See Appendix A.) Time was set aside at the end of the quality circle session to answer the questions.

Collection of Data

The data used in this study was collected from the quality circle members at the Mike Monroney Aeronautical Center. A questionnaire package containing a set of instructions and a 26 question instrument was provided to the facilitator working with the circles. Twenty minutes were set aside at the end of their regular meeting to complete the questionnaire.

The instructions were reviewed by the facilitator, including the need for the study, the confidentiality of the responses, and how the results of the data would be provided their organization for review and consideration. The facilitator made sure each participant understood that his input was strictly voluntary and that he would remain anonymous. The participants were told they would be allowed to complete the questionnaire even if they required more than the twenty minutes allocated.

The participants were asked to respond to a seven point response scale ranging from 1) "strongly disagree" to 7) "strongly agree" for the first twenty-five items which solicited self-appraisals of job perceptions and performance. The scale was explained. The need to respond as accurately as possible was stressed.

The participants were given the option of marking block four or Not Applicable (N/A) on questions that did not apply to their particular situation. The data were

collected over a period of one week with the respondents completing the questionnaire during the last 20 minutes of their regular weekly meeting. The questionnaire was completed by all the participants within the 20 minutes allocated, with most using from 12 to 15 minutes.

The questionnaires were collected and returned to the researcher in the folders provided without names or other trackable information.

Analysis of Data

To analyze the data, the questionnaires were first checked for completeness. The one questionnaire that was incomplete was not used in the analysis. Questionnaires which were analyzed were from respondents who were current participants in the quality circle process and had attended quality circle training. The data were analyzed by comparing percentages and weighted scale scores. The weighted scale involved assigning values to each level of response based upon the degree of agreement or disagreement to the question.

Comparisons were made between the collective responses from each of the quality circles for each of the eight respondent perception areas. These comparisons were made in order to determine which circles perceived they gained more or less benefit from their quality circle involvement.

Total responses were tabulated on the seven point scale to determine patterns of perceptions about their

quality circle involvement according to the eight respondent perception areas.

Summary

This chapter provided the details of the methodology used in the study. Information gained from research about the quality circle process, its historical development in Japan, its arrival in America, and the benefits expressed by users of quality circles were utilized in the development of the research methodology.

The structure of the quality circle, the training required and the results expected were also considered in the design of the appropriate instrument to be used in data collection.

Eight respondent perception areas were identified relating to benefits that could be expected and a 25 question instrument was designed to collect participant perceptions to each question on a seven point Likert Scale to be used in analysis.

The data gathering instrument, support for the study, data collection procedures and procedures selected for analyzing the data were presented.

Chapter IV presents the findings of the study and Chapter V contains the conclusions and recommendations for further use and research.

CHAPTER IV

PRESENTATION OF FINDINGS

In this chapter the results of the 25 question research questionnaire administered to the seven quality circles at the Mike Monroney Aeronautical Center in Oklahoma City, Oklahoma are presented in detail. The sections are presented in the following order: (1) response data, and effects upon (2) qualitative attributes, (3) productivity, (4) organizational communication, (5) job involvement, (6) teamwork, (7) leadership, (8) participation, and (9) human relationships.

Response Data

There were a total of 51 quality circle members actively participating in seven quality circles at the Mike Monroney Aeronautical Center in Oklahoma City, Oklahoma. These were the only quality circle members within the U.S. Department of Transportation Federal Aviation Administration. All 51 instruments were returned, five having no entries, one filled out on one side only and 45 completely answered. The 45 questionnaires with completed responses were the only instruments used in analysis. They comprised a response rate of 88.2 percent.

Respondent Perception Area One: Qualitative Attributes

Respondent perception area one measured participant perception of the effect of the quality circle process on qualitative attributes. Responses marked N/A or block four on the seven point scale received zero points in analysis. Each of the seven quality circle responses was tabulated separately and summarized on Table III by respondent perception area to provide comparison data between circles.

TABLE III

TABULATION OF RESPONDENT PERCEPTION AREA NUMBER ONE QUALITATIVE ATTRIBUTES

	RESPONSE LEVELS							
Q.C. Teams	1 DD	2 MD	3 ID	4 N/A	5 IA	6 MA	7 DA	Total N
#1				5	3(3)	5(1Ø)	5(15)	18
#2	2(- 6)			3		2(4)	3(9)	1Ø
#3				2	3(3)	1(2)	2(6)	8
#4				1	1(1)	3(6)	1(3)	6
#5	1(- 3)	1(-2)		8	2(2)	3(6)	3(9)	18
#6	4(-12)		1(-1)		2(2)	1(2)		8
#7	2(- 6)	2(-4)		8	3(3)	5(1Ø)	2(6)	22
	9(-27)	3(-6)	1(-1)	27(Ø)	14(14)	2Ø(4Ø)	16(48)	9Ø
Totals	13(-34)				5Ø(1Ø2)			

Responses N Weighted Responses (N)

No negative data were recorded in quality circles one, three, and four. Negative responses for the other four quality circles totaled 13 or 14 percent of 9Ø total responses. On the positive side of the scale there were 5Ø responses or 56 percent of 9Ø total responses. Twenty-seven responses or 3Ø percent of the 9Ø responses were marked neither agree nor disagree.

An analysis of data utilizing the weighted scale provided a more accurate picture of respondent perceptions by assigning more points to responses as they moved toward the outer limits. The points and ranges are shown in Table IV. This approach provided a weighted value for recording the degree of emphasis on the response as indicated on the scale.

TABLE IV

ANALYSIS WEIGHT SCALE

	Definite Disagree	Moderate Disagree	Inclined to Disagree	Neither Agree Nor Disagree	Inclined to Agree	Moderate Agree	Definite Agree
Range	-3.5/-2.6	-2.5/-1.6	-1.5/-.6	-.5/.5	.6/1.5	1.6/2.5	2.6/3.5
Points	-3	-2	-1	Ø	+1	+2	+3

The total negative weighted score was (-34) for a total of 136 weighted points in the seven circles under

study. The total positive score was (1Ø2). The total points recorded utilizing the weighted scale analysis approach were 136. Twenty-five percent of the weighted data indicated the respondents perceived that their involvement in quality circles had no effect on qualitative attributes while 75 percent of the weighted data indicated the respondents perceived their involvement in quality circles had some effect on qualitative attributes.

Quality circle six, when taken independently, was the exception in the group with a weighted point total of (-13). This reflected disagreement by the respondents about whether qualitative attributes were affected because of their involvement in the quality circle process.

Respondent Perception Area Two: Productivity

Respondent Perception Area Two measured participant perception of the effect of the quality circle process on productivity. Each of the seven quality circle responses was tabulated separately and summarized on Table V to provide data for comparison between circles.

No negative responses were recorded for quality circles three and four. This may indicate they perceived they benefited in this perception area, more than did the participants in the other five circles. Negative responses for the other five quality circles totaled 59 or 13 percent of 45Ø responses.

TABLE V

TABULATION OF RESPONDENT PERCEPTION AREA NUMBER TWO
PRODUCTIVITY

RESPONSE LEVELS

Q.C. Teams	1 DD	2 MD	3 ID	4 N/A	5 IA	6 MA	7 DA	Total N
#1	1(- 3)	1(- 2)	6(-)	15	17(17)	17(34)	33(99)	9Ø
#2	4(-12)			13	1Ø(1Ø)	8(16)	15(45)	5Ø
#3				5	14(14)	7(14)	14(42)	4Ø
#4				5	3(3)	1Ø(2Ø)	12(36)	3Ø
#5	1Ø(-3Ø)	3(- 6)	6(- 6)	23	15(15)	17(34)	16(48)	9Ø
#6	11(-33)		5(- 5)	4	6(6)	4(8)	1Ø(3Ø)	4Ø
#7	2(- 6)	8(-16)	2(- 2)	28	22(22)	23(46)	25(75)	11Ø
	8(-84)	12(-24)	19(-19)	93(Ø)	87(87)	86(172)	125(375)	45Ø
Total	59(-177)				298(634)			

Responses N Weighted Responses (N)

On the positive side of the scale there were 298 or 66 percent of 45Ø responses. Quality circle six was the exception with 16 negative responses or 41 percent of 4Ø responses. The response of this circle indicated that participation in the quality circle did not affect productivity.

The total negative weighted score was (-177), of 811 total weighted points. The positive side of the scale had a total weighted score of (634) points. The total points utilizing the weighted scale analysis approach were 811. Twenty-two percent of the data indicated the respondents perceived that their involvement in quality circles had no

effect on productivity while 78 percent of the weighted data indicated that their involvement in the quality circle process did affect productivity.

Respondent Perception Area Three: Organizational Communication

Respondent perception area three measured participant perception of the effect of the quality circle process on organizational communication.

No negative responses were recorded for quality circles one, two, and four. Negative responses for quality circles three, five, six and seven totaled 26 or ten percent of 27Ø responses. The positive responses totaled 163 or 6Ø percent of 27Ø responses. (See Table VI.)

The total negative weighted score was (-48) points. The total positive weighted score was (345) points.

The total weighted score was 393 points. Twelve percent of the weighted data indicated the respondents perceived that their involvement in quality circles had no effect on organizational communication while 88 percent of the weighted data indicated that the circle involvement did affect organizational communication.

TABLE VI

TABULATION OF RESPONDENT PERCEPTION AREA NUMBER THREE
ORGANIZATIONAL COMMUNICATIONS

RESPONSE LEVELS

Q.C. Teams	1 DD	2 MD	3 ID	4 N/A	5 IA	6 MA	7 DA	Total N
#1				19	8(8)	4(8)	23(69)	54
#2				8	7(7)	3(6)	12(36)	30
#3	4(-12)				5(5)	6(12)	9(27)	24
#4				5	2(2)	4(8)	7(21)	18
#5	5(-15)	2(-4)	5(- 5)	19	15(15)	5(10)	3(9)	54
#6	1(- 3)		4(- 4)	9	3(3)	4(8)	3(9)	24
#7			5(- 5)	21	16(16)	6(12)	18(54)	64
	10(-30)	2(-4)	14(-14)	81(0)	56(56)	32(64)	72(225)	270
Total	26(-48)				163(345)			

Responses N Weighted Responses (N)

Respondent Perception Area Four:

Job Involvement

Results of respondent perception area four measured participant perception of the effect of the quality circle process upon job involvement. No negative responses were recorded for quality circles three and four. Negative responses for the other five circles totaled 37 or ten percent of 360 responses.

The positive responses totaled 245 or 68 percent of 360 responses. (See Table VII.)

TABLE VII

TABULATION OF RESPONDENT PERCEPTION AREA NUMBER FOUR
JOB INVOLVEMENT

RESPONSE LEVELS

Q.C. Teams	1 DD	2 MD	3 ID	4 N/A	5 IA	6 MA	7 DA	Total N
#1	1(- 3)	1(- 2)	3(- 3)	12	7(7)	15(30)	33(99)	72
#2	2(- 6)			12	7(7)	7(14)	12(36)	40
#3				3	8(8)	10(20)	11(33)	32
#4				3	1(1)	8(16)	12(36)	24
#5	5(-15)	3(- 6)	2(- 2)	16	16(16)	13(26)	17(51)	72
#6	8(-24)		4(- 4)	5	4(4)	2(4)	9(27)	32
#7	1(- 3)	6(-12)	1(- 1)	27	13(13)	14(28)	26(78)	88
	17(-51)	10(-20)	10(-10)	78(0)	56(56)	69(138)	120(360)	360
Total	37(-81)				245(554)			

Responses N — Weighted Responses (N)

The total negative weighted score was (-81) of 635 total weighted points. The positive side of the scale had a total of (554) weighted points.

The total points using the weighted scale were 635. Eighty-seven percent of the weighted data indicated the respondents perceived there was an effect on job involvement. Thirteen percent of the weighted data indicated involvement in quality circles did not affect job involvement. Quality circle six showed the largest percent of disagreement, with 25 percent of their responses in the definitely disagree category.

Respondent Perception Area Five:

Teamwork

Respondent perception area five measured participant perception of the effect of quality circles on teamwork (See Table VIII.)

TABLE VIII

TABULATION OF RESPONDENT PERCEPTION AREA NUMBER FIVE
TEAMWORK

	RESPONSE LEVELS							
Q.C. Teams	1 DD	2 MD	3 ID	4 N/A	5 IA	6 MA	7 DA	Total N
#1	1(- 3)	1(- 2)	4(- 4)	24	10(10)	11(22)	30(90)	81
#2	3(- 9)			16	10(10)	6(12)	10(30)	45
#3	4(-12)			3	11(11)	6(12)	12(36)	36
#4	1(- 3)			6	4(4)	6(12)	10(30)	27
#5	9(-27)	5(-10)	3(- 3)	24	18(18)	9(18)	13(39)	81
#6	8(-24)		4(- 4)	9	5(5)	3(6)	7(21)	36
#7	1(- 3)	7(-14)	2(- 2)	34	13(13)	20(40)	22 (66)	99
	27(-81)	13(-26)	13(-13)	178(0)	71(71)	61(122)	104(312)	405
Total	53(-120)				236(505)			

Responses N Weighted Responses (N)

This is the only respondent perception area in which negative responses were recorded from all seven quality circles. There were 53 negative responses or 13 percent of 405 total responses.

The total positive responses were 236 or 58 percent of

all responses. The total weighted score was (-120) of 625 total weighted points. The total positive weighted score was (505) points. The total points using the weighted scale were 625 with 81 percent of the weighted data indicating the respondents believed involvement in quality circles affected teamwork. Nineteen percent of the weighted data indicated involvement in quality circles did not affect teamwork.

Members of quality circle six appeared to have benefited the least from circle involvement with 28 weighted points of 60 total or 47 percent of their total weighted score on the negative side of the scale. This indicates teamwork may not have been affected in this circle. Quality circle one showed the most benefit in this respondent perception area with 63 percent of their responses on the positive side of the scale. When the weighted scale is considered quality circle one recorded (122) positive points of 131 or 93 percent indicating teamwork had been affected through their involvement in quality circles.

Respondent Perception Area Six: Leadership

Respondent perception area six measured participant perception of the effect of the quality circle process on leadership. (See Table IX.)

TABLE IX

TABULATION OF RESPONDENT PERCEPTION AREA NUMBER SIX
LEADERSHIP

	RESPONSE LEVELS							
Q.C. Teams	1 DD	2 MD	3 ID	4 N/A	5 IA	6 MA	7 DA	Total N
#1			3(-3)	1	3(3)	6(12)	23 (69)	36
#2	1(- 3)			5	3(3)	4(8)	7 (21)	2Ø
#3				1	7(7)	4(8)	4 (12)	16
#4				3		5(1Ø)	4 (12)	12
#5	3(- 9)	2(-4)	2(-2)	6	13(13)	2(4)	8 (24)	36
#6	2(- 6)		2(-2)	1	6(6)	1(2)	4 (12)	16
#7		1(-2)	2(-2)	9	1Ø(1Ø)	6(12)	16 (48)	44
	6(-18)	3(-6)	9(-9)	26(Ø)	42(42)	28(56)	66(198)	18Ø
Totals	18(-33)				136(296)			

Responses N Weighted Responses (N)

No negative responses were recorded in quality circles three and four. Negative responses from the other five circles totaled 18 or ten percent of 18Ø responses.

The positive responses totaled 136 responses or 76 percent.

The total negative weighted score was (-33) points of 329 total weighted points. The total positive weighted score was (296) points.

The total points using the weighted scale were 329 with 9Ø percent of the data indicating the respondents perceived leadership was affected through participation in the quality circle process. The strongest negative

responses to this respondent perception area came from quality circle five. The strongest positive score in this respondent perception area was recorded by quality circle one with 84 weighted points or 97 percent of 87 total weighted points. This indicates that the respondents in this quality circle perceive their participation in the quality circle process affects leadership development.

Respondent Perception Area Seven: Participation

Respondent perception area seven measured participant perception of the effect of the quality circle process on participation.

There were only five negative responses provided in this respondent perception area and they were distributed between two circles. The positive responses totaled 104 or 77 percent of 135 total responses. (See Table X.)

The total negative weighted score was (-8) points of 235 total weighted points. The positive side of the scale had a total weighted score of (227) points.

The total points using the weighted scale were 235. Ninety-seven percent of the data indicated that the respondents believed the quality circle process affected participation. There was no substantial concentration of negative responses in this particular respondent perception area.

TABLE X

TABULATION OF RESPONDENT PERCEPTION AREA NUMBER SEVEN PARTICIPATION

	RESPONSE LEVELS							
Q.C. Teams	1 DD	2 MD	3 ID	4 N/A	5 IA	6 MA	7 DA	Total N
#1				3	3(3)	7(14)	14(42)	27
#2				4	3(3)	4(8)	4(12)	15
#3					4(4)	4(8)	4(12)	12
#4				1		5(1Ø)	3(9)	9
#5	1(- 3)	1(-2)	2(-2)	1	12(12)	5(1Ø)	5(15)	27
#6				4	3(3)		5(15)	12
#7			1(-1)	13	3(3)	4(8)	12(36)	33
	1(- 3)	3(-2)	3(-3)	26(Ø)	28(28)	29(58)	47(141)	135
Totals	5(- 8)				1Ø4(227)			

Responses N Weighted Responses (N)

Respondent Perception Area Eight: Human Relationships

Respondent perception area eight measured participant perception of the effect of the quality circle process on human relationships.

No responses were recorded on the negative side of the scale for quality circle three. The other six quality circles provided responses totaling 53 or 17 percent of 315 responses. Total positive responses were 191 or 61 percent of all responses.

The total weighted score was (-1Ø1) points of 467 total weighted points. The positive responses had a total

weighted score of (366) points.

The total points using the weighted scale were 467. Seventy-eight percent of the data indicated the respondents perceived that their participation in the quality circle process affected their human relationships. The circles with the most negative responses were numbers five and six with a total of 27 or 51 percent. Their responses indicated that human relationships were not affected by participating in the quality circle process.

TABLE XI

TABULATION OF RESPONDENT PERCEPTION AREA NUMBER EIGHT
HUMAN RELATIONSHIPS

RESPONSE LEVELS

Q.C. Teams	1 DD	2 MD	3 ID	4 N/A	5 IA	6 MA	7 DA	Total N
#1	1(- 3)	3 (- 6)	9(- 9)	16	13(13)	12(24)	9(27)	63
#2	2(- 6)			10	7(7)	4(8)	12(36)	35
#3				2	11(11)	6(12)	9(27)	28
#4			1(- 1)	7	2(2)	8(16)	3(9)	21
#5	8(-24)	4 (- 8)	3(- 3)	11	17(17)	8(16)	12(36)	63
#6	7(-21)		5(- 5)	5	6(6)	2(4)	3(9)	28
#7		5 (-10)	5(- 5)	20	20(20)	15(30)	12(36)	77
	18(-54)	12(-24)	23(-23)	71(0)	76(76)	55(110)	60(180)	315
Total	53(-101)				191(366)			

Responses N Weighted Responses (N)

Summary

The purpose of this study was to analyze perceptions of quality circle members about the affects of participation in the quality circle process upon their work environment. It sought to answer questions relating to quality circle member perceptions about self-report measures on qualitative attributes, productivity, organizational communication, job involvement, teamwork, leadership, participation, and human relationships.

The data were collected and analyzed by examining the participant perception responses of the members of seven quality circles at the Mike Monroney Aeronautical Center of the Federal Aviation Administration in Oklahoma City, Oklahoma.

Fifty-six percent of the responses and 75 percent of the weighted data indicated that qualitative attributes had been affected by participation in quality circles. The qualitative attributes mean score was 4.76 on a seven point scale.

Participation in quality circles affects productivity, according to 66 percent of the responses and 83 percent of the weighted data. The productivity mean score was 5.13. (See Table XII.)

Sixty percent of the responses and 88 percent of the weighted data indicated that organizational communication had been affected by participation in quality circles. The

TABLE XII

CONSOLIDATED RESPONDENT PERCEPTION SUMMARY TABULATION

Research Areas	RESPONSE LEVELS 1 DD	2 MD	3 ID	4 N/A	5 IA	6 MA	7 DA	Mean
Qualitative Attributes	9	3	1	27	14	20	16	4.76
Productivity	28	12	19	93	87	86	125	5.13
Organizational Communication	10	2	14	81	56	32	75	5.10
Job Involvement	17	10	10	78	56	69	120	5.31
Teamwork	27	13	13	116	71	61	104	4.95
Leadership	6	3	9	26	42	28	66	5.46
Participation	1	6	7	33	45	40	47	5.36
Human Relationships	18	12	23	71	76	55	60	4.84
Totals	116	61	96	525	447	391	613	5.11

No. Circles 7

Total Members 45

organizational communication mean score was 5.1Ø on a seven point scale.

Participation in quality circles affects job involvement, according to 68 percent of the responses and 87 percent of the weighted data. The job involvement mean score was 5.31.

Fifty-eight percent of the responses and 81 percent of the weighted data indicated that teamwork had been affected by participation in quality circles. The teamwork mean score was 4.95 on a seven point scale.

Participation in quality circles affects leadership, according to 78 percent of the responses and 9Ø percent of the weighted data. The leadership mean score was 5.46.

Seventy-four percent of the responses and 92 percent of the weighted data indicated that participation had been affected by participation in quality circles. The participation mean score was 5.36 on a seven point scale.

Sixty-one percent of the responses and 78 percent of the weighted data indicated that human relationships had been affected by participation in quality circles. The human relationships mean score was 4.84 on a seven point scale.

When all eight respondent perception areas were considered the data indicated 65 percent of the participant responses agreed all areas were affected through participation in quality circles. The mean score for all responses for the eight areas was 5.11 based on the data.

When the weighted scale was used in analysis 84 percent of the points suggested these areas were affected through participation in quality circles.

In summary the total program data indicated, based on respondent perceptions, that the eight respondent perception areas in this study were affected through participation in the quality circle process.

The overall tendency of the Quality Circle program at Mike Monroney Aeronautical Center in Oklahoma City toward the eight respondent perception areas shows a mean of 5.11.

CHAPTER V

SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND IMPLICATIONS

Summary

The purpose of this study was to analyze perceptions of quality circle members concerning how they and their work environment had been affected through participation in the quality circle process.

The study began by reviewing selected literature to determine what benefits were being highlighted by promoters of the quality circle concept. The literature promoting training in the quality circle concept was reviewed to determine tools and techniques with which the quality circle members were required to become familiar.

A panel of experts was identified to provide expertise and wisdom in determining exactly what should be expected from involvement in the quality circle process. The areas that should receive benefits were considered from both the participant and management points of view.

A list of eight participant perception areas was identified which served as a guide in developing the twenty-six question data gathering instrument. The questionnaire was used to collect respondent perceptions of

participants in quality circles as they related to benefits received by circle members. The seven point Likert Scale was used to provide the participants a wide range for their responses and greater flexibility in analysis.

Data were collected about respondent perceptions identifying whether they agreed that the respondent perception areas identified by the panel were being affected. The data were analyzed by respondent perception area and isolated by individual quality circle. The data were then consolidated into the eight respondent perception areas and analyzed. Conclusions that could be identified were listed and recommendations for further research and study were suggested.

Conclusions

Participating quality circle members felt qualitative attributes were affected by their participation in the quality circle process.

Quality circle members perceived that productivity had been affected through involvement in the circle process.

Members perceived organizational communication was affected by their involvement in quality circles.

Participation in the quality circle process affected job involvement, according to the participants in the study.

Quality circle members perceived teamwork was affected by their participation in the quality circle process.

Participants reported that leadership was affected by their involvement in the quality circle process.

Members indicated that involvement in the quality circle process affected participation.

Human relationships were affected by employees participation in quality circles.

All eight selected respondent perception areas were affected through quality circle member participation.

The quality circle program at the Mike Monroney Aeronautical Center can be assured that the eight respondent perception areas identified by the panel were affected through involvement in the quality circle process.

Work areas starting new circles at the Mike Monroney Aeronautical Center should expect to receive similar returns from participating in the quality circle process.

Recommendations for Further Research and Study

The following recommendations for further research are offered:

1. This study should be replicated in various industries to determine whether similar perceptions are occurring in quality circles.

2. A study should be made to compare the effects reported by participants in the quality circle process from white collar work environments to those reported from blue collar work environments.

3. This study should be replicated with a larger population for comparative analysis.

4. A study should be made to determine whether quality circles affect attitudes of managers who have no quality circles.

Implications

1. The freedom of expression provided employees in quality circles will open the door for managers to use talents previously ignored.

2. Long term intangible benefits from quality circles will become recognized as more beneficial to the organization than the tangible dollar returns presently being praised.

3. Emphasis will be placed upon involving all employees of an organization in long term decisions which affect the company.

4. Management and union leaders will begin to work together for the betterment of the company and its employees because of the contributions of quality circles.

5. Companies will continue to increase resources in support of participative programs for employees and managers.

6. Trends toward long range planning will become more popular partly because of investments in human resources.

7. The benefit employees perceive they gain from participation in quality circles is the most important long

term benefit the organization receives.

8. Increased freedom of expression provided employees in areas that affect them and their work environment will open the door for greater demands from them to satisfy those needs.

SELECTED BIBLIOGRAPHY

Blair, J. D., S. L. Cohen, J. V. Hurwitz. "Quality Circles: Practical Considerations for Public Managers." Public Productivity Review (March/June 1982), pp. 6-18.

Bryant, S., and J. Kearns. "The quality circle program of the Norfolk Naval Shipyard." Reprinted in Quality Circle Readings, WPAFB: AFIT, n.d., pp. 131-146.

Cole, R. E. "Learning from the Japanese: Prospects and Pitfalls." Management Review (September 1980), pp. 22-42.

Comstock, V. C., and G. E. Swartz. "One Firm's Experience with Quality Circles." Reprinted in Quality Circle Readings, WPAFB: AFIT, n.d., pp. 158-180.

Dailey, J. J., Jr., and R. L. Kagerer. "A Primer on Quality Circles." Supervisory Management (June 1982), pp. 40-43.

Dewar, D. L. Quality Circles: Answers to 100 Frequently Asked Questions. Red Bluff CA: Quality Circle Institute, 1979.

Dewar, D. L. The Quality Circle Handbook. Red Bluff, CA: Quality Circle Institute, 1980.

Donovan, M., and B. VanHorn. "Quality Circle Program Evaluation." Transactions of the Second Annual Conference of the IAQC (1980), pp. 96-101.

Hatvany, N., and V. Pucik. "An Integrated Management System: Lessons from the Japanese Experience." Academy of Management Review, Vol. 6, No. 3 (1981), pp. 469-478.

Juran, J. M. "International Significance of the QC Circle Movement." Quality Progress (November 1980), pp. 18-22.

Lloyd, R. F., and V. Rehq. "Quality Circles--Theoretical Foundations and Empirical Evidence: Applications for Vocational Education." A Monograph Submitted to

National Center for Research in Vocational Education, October 1982.

Mento, A. J. "Some Motivational Reasons Why Quality Circles Work in Organizations." Transactions of the Fourth Annual Conference of the IAQC (March 1982), pp. 284-297.

Nelson, D. J. "What Motivated People Can Do." Transactions of the Second Annual Conference of the IAQC (February 1980), pp. 37-40.

Ouchi, W. G. Theory Z: How Americans can Meet the Japanese Challenge. Reading MA: Addison-Wesley Publishing Company, 1981.

Patchin, R. I. "Quality Circles: What's Next?" Reprinted in Quality Circle Readings, WPAFB: AFIT, n.d., pp. 187-188.

Riley, F. "A Message from the President." The Quality Circles Journal, Vol. V3 (August 1982), p. 3.

Sikes, W., Connell, L., and M. Donovan. "Learning from Experience: Ingredients for Success and Popular Myths about Quality Circles Programs." Transactions of the Second Annual Conference of the IAQC, (February 1980), pp. 90-95.

Steel, R. P., N. D. Ovalle, II, and R. F. Lloyd. "Quality Circles in the Department of Defense: Some Preliminary Findings." Paper presented at 24th annual meeting of the Military Testing Association, 1982.

Steel, R. P., R. F. Lloyd, N. D. Ovalle, II, and W. H. Hendrix. "Designing Quality Circles Research." The Quality Circles Journal (1982), 5, pp. 40-43.

Thompson, P. C. Quality Circles: How to Make Them Work in America. New York, NY: AMACON, 1982.

Tortorich, R., P. Thompson, C. Orfan, D. Layfield, C. Dreyfus, and M. Kelley. "Measuring Organizational Impact of Quality Circles." The Quality Circles Journal (1981), IV, pp. 24-33.

Yager, E. "Quality Circle: A Tool for the 80s." Training and Development Journal (August 1980), pp. 60-62.

APPENDICES

APPENDIX A

PANEL OF EXPERTS

PANEL OF EXPERTS

The following list addresses the position titles and qualifications of the members who served on this panel.

1. Branch Manager:

Involved in initial investigation relating to the applicability of quality circles to the organization. Received quality circle leader and facilitator training for instructors. Developed training package for quality circle leaders and members. Provided training for initial quality circle groups and served as leader, facilitator, and coordinator for the organization'squality circle program over the last five years. Served as vice president in the local "Wildcatters" quality circle chapter in 1984 and as president in 1985 and presently on Board of Directors. Degrees include a B.A. and M.A. in Business Administration and presently working on a Ph.D. in Human Resource Development. Guest speaker at Quality Circle Conference in Oklahoma City and Region 7 Conference for the International Association of Quality Circles.

2. Program Analyst:

Involved in initial research on the quality circle concept and its potential application to his company. Received quality circle leader and facilitator training for instructors. Developed the training package for quality

circle leaders and members. Provided training for initial circle groups in the company. Served as leader, facilitator and program coordinator for the quality circles over the last five years. Involved in the local "Wildcatters" chapter for the past four years as presenter, speaker, committee chairman and member, secretary and editor of newsletter. Participated as speaker at the local chapter conference and workshop and guest speaker at the 1986 International Association of Quality Circles Region Seven Conference. Educational background includes the pursuit of a B.A. degree in Business Administration.

3. Program Manager:

Involved in initial start up of the quality circle program within the company. Completed quality circle leader and facilitator training for instructors. Developed the training package used in training company employees. Provided training for quality circle groups and served as quality circle leader, facilitator and coordinator over the past seven years. Served as Vice president of the local "Wildcatters" chapter in 1983 and as president in 1984. Participated as speaker at the 1982 Department of Defense Conference in Washington D.C. Participated as speaker at the Local Chapter Conference and a number of workshops. Served as Committee Chairman and member in support of the local chapter. Educational background includes a B.A. in Business and post graduate work on an M.A. in Political Science.

4. Program Analyst:

Involved in initial pilot circles within the department. Completed quality circle leader and facilitator training for instructors. Worked with committee in developing training materials to be used in sessions. Provided training for quality circle members and leaders over the past seven years. Participated as speaker in the local "Wildcatters" chapter. Provided workshops on quality circle techniques. Served as facilitator and coordinator of company quality circle program for past six years. Made presentations to managers on the effects and benefits the company has received from quality circles. Participated as conference speaker on participative management concepts. Educational background includes a B.A. in Business Management and an M.S. in Education.

5. Program Analyst:

Involved in quality circles for the past five years. Completed quality circle leader and facilitator training for instructors. Provided training for member and leaders of quality circle groups. Served as leader and facilitator for department quality circle groups. Participated as speaker at local "Wildcatters" meetings. Served as committee chairman on conference agenda and is presently serving as president of the local "Wildcatters" chapter of the International Association of Quality Circles. Educational background includes a B.A. degree in Business.

6. Program Analyst:

Involved in management of the organization's productivity program for the past 15 years. Involved in initial pilot quality circles. Provided facilitator and coordinator support for the quality circle program within the directorate for the past seven years. Instrumental in selecting qualified instructors for the quality circle program. Involved in analysis and reporting of quality circle involvement to department managers. Completed requirements for a B.A. degree in Management.

7. Productivity Specialist:

Involved in initial pilot circle effort within the department. Completed quality circle leader and facilitator training for instructors. Worked on initial training package for quality circle members and leaders. Provided facilitator support for department quality circle program for past six years and trained quality circle members and leaders in support of the program. Educational background includes a B.S. and M.S. in psychology.

8. Productivity Specialist:

Involved in quality circles for the past five years as instructor, leader and facilitator. Completed quality circle leader and facilitator training for instructors. Provided facilitator support for organizational quality circle leaders and members. Worked with local chapters in providing presentations to membership. Served on local "Wildcatters" group as chairman for the

development of current year agenda. Educational background includes 24 hours toward an undergraduate degree.

9. Productivity Specialist:

Served as quality circle facilitator for the division for the past six years. Completed quality circle leader and facilitator training for instructors. Trained quality circle members and leaders for the division. Made presentations to managers on quality circles and the benefits for the organization.

APPENDIX B

DATA GATHERING INSTRUCTIONS/INSTRUMENT

INSTRUCTIONS FOR ADMINISTRATION OF QUALITY CIRCLE QUESTIONNAIRE

I. PRIVACY ACT STATEMENT

A. Purpose is to collect information for use in determining attitudes of Quality Circle members as part of our Quality Circle program evaluation.

B. Participation is entirely voluntary; however, if a member does not participate, valuable information will be lost. All participants will remain anonymous.

C. No adverse action may be taken against any member who elects not to participate.

II. ADMINISTRATION

A. Encourage members to answer each question as honestly as possible.

B. Explain the scoring key. Number one (1) very negative to number seven (7) very positive. Annotate the number best representing the member's feeling in the block provided after each question.

C. If a particular question is not applicable (sample question 17) then write N/A in the space provided.

D. After question 26, space is provided for comments. Use back of both sheets if needed. Encourage both pro and con constructive comments.

E. Ask members to address any questions concerning the questionnaire to the Facilitator before or during administration.

F. Dismiss any member not wishing to participate.

III. EVALUATION

A. Review each questionnaire for completeness.

B. Review any comments to question 26.

C. Provide any comments at the time questionnaires are delivered to the Productivity Office. Keep each circle's questionnaire separated in a package.

QUALITY CIRCLE MEMBER QUESTIONNAIRE

KEY:

1	2	3	4	5	6	7
DEFINITELY DISAGREE	MODERATELY DISAGREE	INCLINED TO DISAGREE	NEITHER AGREE NOR DISAGREE	INCLINED TO AGREE	MODERATELY AGREE	DEFINITELY AGREE

1.	I have voluntarily participated in Quality Circle activities.	[1] [2] [3] [4] [5] [6] [7]
2.	I have attended most of our Quality Circle meetings.	[1] [2] [3] [4] [5] [6] [7]
3.	My Quality Circle has made presentations to management on proposed changes.	[1] [2] [3] [4] [5] [6] [7]
4.	Participation in Quality Circles has made my job more enjoyable.	[1] [2] [3] [4] [5] [6] [7]
5.	Taking part in Quality Circles has improved my relationship with others in the unit.	[1] [2] [3] [4] [5] [6] [7]
6.	Taking part in Quality Circles has improved my relationship with employees in other units which I have to deal with as a part of my job.	[1] [2] [3] [4] [5] [6] [7]
7.	Having a Quality Circle has improved the quality of workmanship in our organization.	[1] [2] [3] [4] [5] [6] [7]
8.	Having a Quality Circle has improved the productivity of our unit.	[1] [2] [3] [4] [5] [6] [7]
9.	I believe management is happy we have the Quality Circle Program.	[1] [2] [3] [4] [5] [6] [7]
10.	I think having the Quality Circle make presentations to management is a good idea.	[1] [2] [3] [4] [5] [6] [7]
11.	I believe the time spent in Quality Circles is justified based on improvements made or prospective improvements.	[1] [2] [3] [4] [5] [6] [7]
12.	I feel Quality Circles should be expanded to include other groups within my Branch.	[1] [2] [3] [4] [5] [6] [7]
13.	I feel that our Quality Circle Leader has been performing at an acceptable level.	[1] [2] [3] [4] [5] [6] [7]

QUALITY CIRCLE MEMBER QUESTIONNAIRE

KEY: 1 = DEFINITELY DISAGREE; 2 = MODERATELY DISAGREE; 3 = INCLINED TO DISAGREE; 4 = NEITHER AGREE NOR DISAGREE; 5 = INCLINED TO AGREE; 6 = MODERATELY AGREE; 7 = DEFINITELY AGREE

14.	I feel having the facilitator at the Quality Circle meetings helps the Circle activities.	[1] [2] [3] [4] [5] [6] [7]
15.	Because of Quality Circle activities, communication between management and the Circle members has improved.	[1] [2] [3] [4] [5] [6] [7]
16.	Quality Circles has helped provide me an opportunity to participate in decisions affecting my work area.	[1] [2] [3] [4] [5] [6] [7]
17.	Cooperation between shifts has improved since Quality Circle activities began.	[1] [2] [3] [4] [5] [6] [7]
18.	Quality Circles has allowed me to participate in job related improvements.	[1] [2] [3] [4] [5] [6] [7]
19.	Quality Circles have helped my supervisor become more efficient and helpful.	[1] [2] [3] [4] [5] [6] [7]
20.	Quality Circle activities have helped eliminate much of the criticism in this organization.	[1] [2] [3] [4] [5] [6] [7]
21.	The atmosphere in our work area is more cooperative since our Quality Circle began.	[1] [2] [3] [4] [5] [6] [7]
22.	The overall attitudes toward work have improved since our Quality Circle began.	[1] [2] [3] [4] [5] [6] [7]
23.	Quality Circles have helped my co-workers to receive recognition for a job well done.	[1] [2] [3] [4] [5] [6] [7]
24.	My co-workers take more pride in their work since our Quality Circle program began.	[1] [2] [3] [4] [5] [6] [7]
25.	Since our Quality Circle began, I feel more job satisfaction.	[1] [2] [3] [4] [5] [6] [7]

26. Please add any comments you wish to make about your involvement in Quality Circles:

APPENDIX C

OBJECTIVE MATRIX

TABLE XIII

QUALITY CIRCLE MEMBER RESPONDENT PERCEPTION AREA MATRIX

RESPONDENT PERCEPTION AREA	QUESTIONS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1. Qualitative attributes								x																	x	
2. Productivity		x	x		x				x										x		x		x	x	x	x
3. Organizational communications				x			x							x	x	x		x								
4. Job Involvement		x			x							x					x		x		x	x			x	
5. Teamwork			x	x									x				x	x			x	x	x			x	
6. Leadership											x			x			x							x		
7. Participation															x		x	x								
8. Human relationships							x				x					x				x		x	x			x	

APPENDIX D

LETTER OF PERMISSION

George Graham
OC-ALC/XRSP
Tinker AFB, OK 73145-599Ø
January 16, 1986

Mr. Earl Mahoney
P.O. Box 25Ø82 AAC-26Ø
Oklahoma City, OK 73125

Dear Sir:

I am a student attending Oklahoma State University working toward the completion of my studies for a Master's Degree in Occupational and Adult Education. The course study requires the completion of a thesis and I would like your support and guidance to aid me in fulfilling this requirement. I have consulted with Mr. Ron Johnson of your staff to assist me in gathering data, and in the development and validation of my data gathering instrument on Quality Circle participant benefits.

Your permission and support concerning this matter is greatly appreciated. A copy of the results of this study will be provided for your internal departmental use.

GEORGE GRAHAM
Program Analyst

1st Ind

Approved/Disapproved

VITA

George Dexter Graham

Candidate for the Degree of

Master of Science

Thesis: A MEASURE OF PARTICIPANT PERCEPTIONS ABOUT THE BENEFITS OF QUALITY CIRCLE INVOLVEMENT

Major Field: Occupational and Adult Education

Biographical:

Personal Data: Born in Wardville, Oklahoma, March 1, 1939, the son of Roy (NMN) and Martha E. Graham. Married to Martha F. Burleson on June 5, 1964.

Education: Graduated from Ashland High School, Ashland Oklahoma in May 1957; received Associate of Science Degree from Oklahoma City Southwestern College in May 1971; received Bachelor of Arts degree from Oklahoma City University in December 1982; completed requirements for Master of Science Degree at Oklahoma State University, Stillwater, Oklahoma in December 1986.

Professional Experience: Enlisted in the USAF as Personal Equipment Specialist 1957-1962; Rural Electric Lineman 1962-1963; Industrial Machinist 1963-1969; Industrial Engineering Technician and Instructor 1969-1976; Management Systems Analyst 1975-1977; Orthodox Job Enrichment Specialist and Instructor 1977-1980; Program Analyst and Instructor in Behavioral Sciences, Tinker AFB, Oklahoma 1980-present.