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A Follow-on Study of University Efforts to Provide Students with the Ability to Comprehend and Apply Total-Quality Principles in Their Fields of Study

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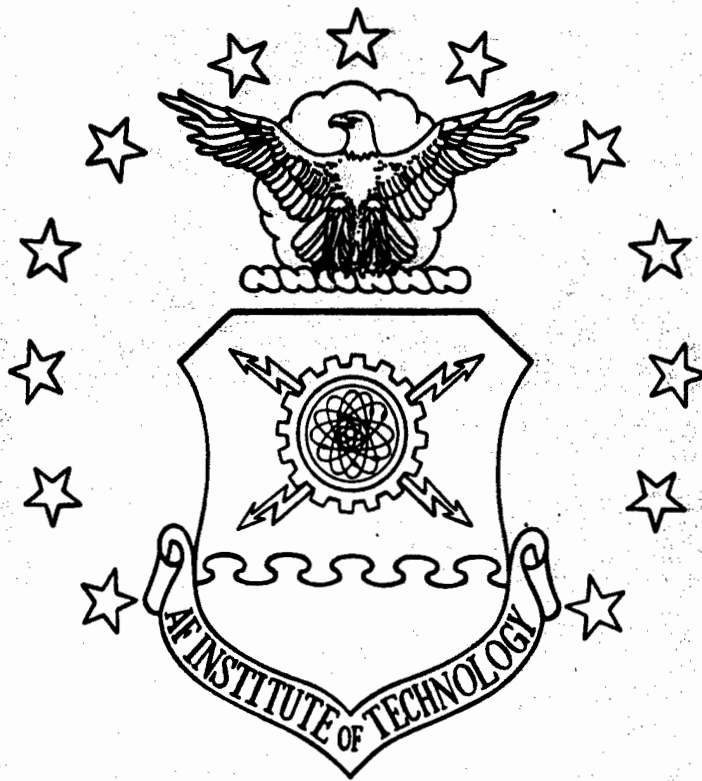
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THESIS

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AFIT/GSM/LAS/96S-1

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The views expressed in this thesis are those of the authors
and reflect the official policy or position of neither the
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THESIS

Presented to the Faculty of the School of Logistics and

Acquisition Management

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Air University

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In Partial Fulfillment of the

Requirements for the Graduate Degrees in Contract Management

and Systems Management

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Abstract

This follow-on research investigated the educational processes employed by universities to enable their students to comprehend and apply Total Quality principles. The results of this research are intended to be used by Department of Defense institutions of higher education as a current guide to help them adopt practices which will enable their students to comprehend and apply Total Quality in their future assignments.

Using a source list of schools from <u>Quality Progress</u> (Sept. 1995), contact individuals were interviewed at several civilian and military universities across the United States. Investigative questions were developed and asked concerning the specific educational processes of curriculum development, course construction and delivery, and the use of various feedback techniques. The results of the interviews were consolidated, compared, and contrasted to produce a guide of activities that have been attempted by universities trying to impart the principles of Total Quality to their students. By using processes similar to those of the prior research, an overview of changes in the teaching of total quality principles in the past three years was also developed.

A FOLLOW-ON STUDY OF UNIVERSITY EFFORTS TO PROVIDE STUDENTS WITH THE ABILITY TO COMPREHEND AND APPLY TOTAL QUALITY PRINCIPLES IN THEIR FIELDS OF STUDY

I. Introduction

General Issue

Doing business in the United States has changed dramatically over the past two decades, while America's ability to remain a leader in the world business community is becoming more difficult with each passing day. Technological advances, revolutions in communications, and the ease with which information and people cross borders have created world marketplaces rich in opportunities, challenges, and risks. The economic and political status-quo that dominated world events for over 40 years terminated silently with the end of the cold war. The mechanisms that allow the United States to influence world events are threatened by public- and private-sector competition. Customers, whether in the form of consumers or taxpayers, are pushing the limits on what they expect from industry and government suppliers. These same suppliers are forced to meet these demands with tighter budgets, fewer resources, fewer tax dollars, and general fiscal austerity. The pressures to improve the situation are dramatic, and the

search to find solutions is all-encompassing. When job or program survival is at stake, the search for improving this situation can be overwhelming. Solutions, however, are proving to be more elusive than ever.

For decades, America has relied on academia to offer ideas for solving its toughest problems, and the present is no exception (Potocki & Brocato, 1994:68). As the demand to remain competitive in world markets grows, pressure to improve profitability and efficiency in US industry and government increases as well. Now, more than ever, college graduates should be in great demand; however, exactly the opposite is true. Civilian and government employers complain that American university graduates do not have the skills necessary to create the ideas to help American businesses prosper (Ivancevich & Ivancevich, 1992:14).

The processes that colleges and universities use in educating their students are increasingly scrutinized for their ability to produce graduates who are mentally prepared to meet demanding employment requirements. Examining these processes shows an inherent lack of prerequisite course work necessary to meet the challenges American businesses face (Ivancevich & Ivancevich, 1992:14). There is little doubt that institutions of higher education must evolve along with the rest of the world. In fact, the "education industry" has never been under greater pressure to change. A

dwindling pool of students, growing dissatisfaction, and frustration with the cost of a college education are all causes for concern. There is also the perception that a degree in today's market will have much less effect on career success because the national headlines all advertise corporate downsizing, restructuring, and personnel layoffs (Fram & Camp, 1995:69). Furthermore, students and parents alike continue to be overwhelmed by the spiraling costs and financial pressures they face. It is not uncommon for a four-year undergraduate degree at a private school to total more than $100,000 (Meltzer, 1994:79). Public schools are not immune to these challenges, either. Many state schools are under such serious budgetary constraints that it is almost impossible to offer the required classes necessary for the completion of a degree (Fram & Camp, 1995:69).

It would appear that colleges and universities are failing to meet the needs of their customers, and, although there are many stakeholders present in acquiring an education, there are only a few who are truly customers. A customer can be defined in several different ways. There is the parent-customer, who tends to be the person who pays for the student's education. There is the student-customer, who is the most direct recipient of the education. Finally, there is the employer-customer, who exploits the student and his or her education.

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A commonly accepted definition of the term *customer* is the "end user of the firm's products and services" (Ivancezich, 1994). Although society is the ultimate beneficiary of an educated populace and workforce, the corporate side of society acts as the conduit, setting the stage for success or failure. Corporate America, with its wealth of resources, ultimately capitalizes on the talents of university graduates. For this reason, it is the employer-customer who we chose as the main recipient of the education commodity.

When an employer obtains a new worker who lacks the skills and knowledge necessary to perform his or her job sufficiently, time and money must be invested in training the worker in these areas. Most graduates perform proficiently in their specialization, but also require significant additional training and development costing millions of dollars per year in order to reach the level required to enter the workforce as contributing members (Walker, 1995:104).

American colleges and universities do not lack in their ability to deliver a quality education in a variety of disciplines. Indeed, today's American graduates are among the world's finest when it comes to breadth of education and depth of specialty. It is what the university emphasizes and where it places its focus that may be irrelevant

(Froiland, 1993:52). The university's ability to deliver a
quality education is not in question. However, its ability
to educate in the areas of quality is lacking. Students are
graduating with technical and analytic skills, but without
people skills. Students need a clear idea of how an
organization's functions are integrated and a better sense
of organizational reality. Many universities are finding
that the principles of Total Quality Management (TQM)
provide the best way to redress these shortcomings.

Specific Problem

The DoD has encountered numerous problems in its
development of a quality education for the university level
student. A 1993 Air Force Institute of Technology Masters
thesis, "A Study of University Efforts to Provide Students
with the Ability to Comprehend and Apply Total Quality
Principles in their Fields of Study," developed a first-look
comparison of how several institutions had approached the
education of quality in the classroom. This previous effort
provided an outline detailing how some of the best programs
were organized. Until this research was completed, all the
reference material present was "generally unfocused and
anecdotal--leading to confusion as to what initiatives [had]
actually produced success" (Bond & Shimel, 1993:5). Due to
the rapid improvements that are being made in many quality

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programs, material produced just three years ago is already dated. Therefore, the problem of no comprehensive guidance for university faculty to apply in curricula arises again.

This problem will be reconsidered and expanded upon in this research effort. Much like the past research, this study will present current information detailing how the leading universities provide a quality education to their students and create an opportunity to visualize the growth that education in quality has undergone in the past three years.

Research Objective

The purpose of this research is to provide material that will enable Department of Defense (DoD) university faculty to provide their students with a means of better comprehension of and ability in the application of total quality principles in their fields of study. It will also provide the university with a tool for evaluating its ability to compete with other universities in the development of its curriculum. By comparing their efforts to the detailed investigations provided, DoD schools will be able to better integrate the education styles into their program and determine how their curriculum matches that of the noted academic quality leaders.

Research Question

This research will primarily focus on observing efforts that noted universities are applying in their programs in order to prepare students with the knowledge and expertise necessary to apply quality principles successfully in the workforce. Improvements that have been made in the past three years will be an area that will be analyzed in depth. Therefore, our key research question is, "What improvements in educational processes have various institutions initiated to provide their students with the ability to comprehend and apply total quality principles in their fields of study in the past three years?"

Investigative Questions

Having identified a general research question, our focus now moves on to a more specific level, that of the investigative questions. Investigative questions are those the researcher must answer to satisfactorily respond to the general question (Cooper & Emory, 1995:58). In order to adequately explore what processes the noted institutions have initiated in their efforts to provide the student with the ability to comprehend and apply total quality principles in their fields of study, the following investigative questions must be examined:

1. What curriculum development methods are the noted institutions using to provide students with the ability to comprehend and apply total quality principles in their fields of study?

2. What course construction and delivery methods are the noted institutions using in order to provide students with the ability to comprehend and apply total quality principles in their fields of study?

3. What sort of feedback are the noted institutions using to measure success of their programs in achieving the objective of providing students with the ability to comprehend and apply total quality principles in their fields of study?

4. What are the general strengths and weaknesses of these processes, and what corrective actions are the institutions taking to correct the deficiencies?

5. What lessons have been learned in the past three years in your institution's development and presentation of a program which provides students with the ability to comprehend and apply total quality principles in their fields of study?

The main objective of these questions is to gather data and to gain insight from the noted universities on how they have implemented quality programs at their institutions. Information gathered from the answers to these questions

will provide a research stream from which guidance can be developed for DoD educational institutions.

Scope of Research Efforts

Because many DoD university organizations are at different levels in their development of a quality curriculum, and because excellent quality education is situationally and contectually dependent, this research effort will focus on what is being done in the educational arena rather than compare and contrast ideas. The descriptive nature of this research attempts to identify the practices of the institutions that are declared quality leaders and to provide a guideline for development of methods and ideas.

The research presented is limited to thirteen universities that provide an education in quality. Because of the impracticality involved in contacting a larger number of universities, many ideas and methods that are being developed and integrated are potentially lost. Furthermore, due to the inherent differences between civilian and DoD universities, methods and ideas developed in one area may not be transferable to another.

Assumptions

Assumptions made in this research effort may not necessarily have the same effect or meaning in all educational environments. Its application is limited if the conclusions are not consistent with the assumptions made by the reader when approaching this research effort.

Investigation of these universities was made with the assumption that anyone reading this information would have an understanding of the quality process and would be part of an institution that would be open to changes in its curriculum. It is not the intent of our investigation to persuade educators to adopt a curriculum that embraces total quality principles. Rather, it is assumed that those interested in this research will have already acknowledged the benefits that a total quality education can provide and are now simply looking for ways to better implement such a program.

Definitions

The following terminology will be used throughout this thesis. Except as noted, the definitions are taken directly from the Glossary of Quality Air Force Terms, written by the Air Force Quality Center.

Affinity Diagram: A management tool that assists with general planning. It makes disparate language information understandable by placing it on cards and grouping the cards together n a creative manner.

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"Header" cards are used to summarize each group of cards.

Attributes, Method of: Measurement of quality by the method of attributes consists of noting the presence (or absence) of a characteristic or attribute in each unit in the group under consideration; counting how many units do (or do not) possess the quality attribute, or how many events occur in the unit, group, or area.

Baldrige Award: The Malcom Baldrige National Quality Award is an annual award to recognize American companies that excel in quality management and quality achievement.

Benchmarking: The process of finding and adapting best practices to improve organizational performance.

Brainstorming: An idea-generating technique that uses group interaction to generate many ideas in a short time period. Ideas are solicited in a non-judgmental unrestricted manner.

Charter: A written commitment by management stating the scope of authority for an improvement group. Resources, including time and money, are specifically addressed.

Consensus Decision: A decision made after all aspects of an issue, both positive and negative, have been reviewed or discussed to the extent that everyone openly understands, supports and participates in the decision.

Consultant, Quality: An individual who has experience and expertise in applying quality tools and techniques to resolve process problems and who can advise and facilitate an organization's quality improvement efforts.

Cost of Quality: The sum of the cost of prevention, inspection, and failure. The key financial measurement tool that ties process control and process optimization into a total process management effort.

Cost-Benefit Analysis: A way to compare the costs and benefits of plans. Can be used for comparing the financial outcomes of different actions and determining if a particular action makes sense financially.

Critical Processes: Processes that present serious dangers to human life, health, and the environment, or risk the loss of very large sums of money and/or customers. Critical processes usually require numerous safety features to be built into the operational quality control system.

Cross-Functional: A term used to describe individuals from different organizational units or functions who are part of a team to solve problems, plan and develop solutions affecting the organization as a system.

Customer: Anyone for whom an organization or individual provides goods or services. Can be internal or external.

Empowerment: Act of placing accountability, authority, and responsibility for processes and products at the lowest possible level. The extent of how much a person is empowered is dependent on their capabilities and the seriousness of the consequences.

External Customers: Those who use the product or the service supplied by the organization, but are not members of the organization that produces the product.

Feedback: Communication from the customer about how process output compares with customer expectations.

Implementation: A structured approach that addresses all aspects (who, what, when, where, why, and how) of incorporating improvements into the process or system.

Internal Customers: Those who are impacted by the product or service and are also members of the organization that produces the product or service.

Just-in-Time (JIT): A concept where an item is delivered, just-in-time, where and when it is needed.

Just-in-Time Training: A process of providing training when it is needed. Eliminates the need for refresher training due to subject knowledge loss experienced if training precedes, over an extended period of time, the knowledge use.

Paradigm: A set of rules and regulations that defines boundaries and tells what to do to be successful within these boundaries.

Process Action Team (PAT): A repeatable activity that is
    characterized by a set of specific inputs; tasks that
    are intended to add value for the customer to the
    inputs; and a set of specific outputs.

Quality: Consistently meeting or exceeding customer
    expectations.

Quality Air Force (QAF): The Air Force approach to total
    quality management: a leadership commitment and
    operating style that inspires trust, teamwork, and
    continuous improvement everywhere in the Air Force.

Stakeholder: Any individual, group, or organization that
    will have a significant impact on, or will be
    significantly impacted by, the quality of the product
    or service you provide.

Total Quality: A strategic integrated system for achieving
    customer satisfaction that involves all managers and
    employees and users quantitative methods to
    continuously improve an organization's processes.
    Often combined with other words to indicate this
    approach to various organizational function or
    activities, as in: total quality management, total
    quality leadership, total quality culture.

Preview of the Following Chapters

This thesis will explore and analyze the efforts of

various universities that have instituted total quality

principles in their curricula. The literature review in

Chapter II explores the most current literature researched

in this field. Chapter III details the methodology of the

research. Chapter IV contains the results and analysis of

the research. Chapter V contains the overall summary and

conclusion.

II. Literature Review

Introduction

A certain synergy exists between total quality management and learning. Indeed, TQM principles and practices are becoming so pervasive in the United States that they are actually revitalizing the way in which we operate in business, government, health care, social organizations, and even our home life (Bonstingl, 1992:4). Linking the quality revolution to education is not a new concept, but rather one which is becoming more common. As TQM finds its way into more and more of our schools, some enlightened educators are discovering the natural fit that quality principles and practices have with their own aspirations for continuous improvement of education.

The 1980s and 1990s have been wrought with dramatic changes in almost every aspect of public and private life. Changing political agendas, shrinking budgets, and reduced workforces all created an impetus to change standard operating procedures. In fact, it is becoming more commonplace to criticize the very institutions of higher education that are so often considered harbingers of change.

Many people support the assumption that the undergraduate curriculum is in worse condition today than it was 30 years ago. Core requirements are further away from meeting the needs of students and society than they were in

1963 (Fisher, 1993:16). This watering down of degrees has far-reaching implications that impact our ability to compete, both internally and externally, as a nation. Furthermore, institutions of higher education are in worse financial shape today than at any other point in the past fifty years (Hartley, 1993:337).

For decades, academia has been growing, and it is now being placed on the defensive to pay for this growth. A 1990 study financed by the U.S. Department of Education indicates that, between 1975 and 1985, the number of four-year college students increased by 7 percent and the number of full-time faculty members increased by 6 percent. During this same period, administrative costs increased 18 percent (Hartley, 1993:338). Financial aid and private donations are not matching these costs, and parents and students are finding it increasingly more challenging to afford the spiraling tuition increases they face.

While all these financial crises are being played out, America's colleges and universities are undergoing a crisis of public self-confidence. Public Opinion analyst Louis Harris reports that dissatisfaction with higher education has been increasing at a remarkable rate. He has been measuring the levels of confidence that people have in the major institutions of U.S. society and has found that the public's confidence in higher education administrators has

dropped nearly 30 percent since 1960, with an all time low of 25 percent in 1992 (Hartley, 1993:337).

U.S. institutions of higher learning, and academia in general, must find ways to increase productivity, reduce costs, and improve their ability to compete, much in the same way as U.S. industries are being challenged to do. American companies saw huge losses in market share and profits in the 1970s and early 1980s, as well as a general loss of public self-confidence. Most of these blows were dealt by the hands of astute overseas competitors, but perhaps more importantly, American industries suffered even greater losses because of their inability to recognize shifts in consumer preferences. American companies grew complacent and had taken their focus off of the customer. American institutions of higher learning have grown complacent and have taken their focus off of the customer, the student, as well.

Academia can be criticized for failing in many areas, but nowhere is this failure more egregious than in customer focus. Too often, the primary customer of education, the student, has been given a back seat or, worse yet, simply overlooked. In the words of Dr. Shalala, chancellor of the University of Wisconsin-Madison, "The needs of our undergraduates are sometimes an afterthought at many of our universities" (1993:7).

TQM concepts have literally taken the U.S. by storm. Few companies that are unfamiliar with this philosophy remain, and fewer still have failed to embrace at least a few of the concepts. TQM has infiltrated corporate America, and its concepts are helping to revitalize American industry. TQM's team-oriented, management-driven concepts have successfully aided overall corporate productivity and customer satisfaction for many companies worldwide (Stratton, 1991:70). While these concepts are not a "cure-all" solution, they have many important applications for American higher education. Debates on campuses across the country continue to rage as these institutions struggle to answer the call for changes in academic stagnation, paradigms, and status-quo.

There have been a number of studies and innumerable articles that examine this problem. This literature review explores the current issues and trends which are affecting higher education, both military and civilian, and attempts of institutions to implement total quality concepts. To facilitate this research, we have decided to focus on six critical aspects for implementing a quality culture on campus. They are as follows: the basic principles of total quality, including defining who the customer is and what role the institution must play to be responsible for providing a quality education; continuous improvement;

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empowerment; benchmarking; quality in Academia, administrative gains in quality improvement versus gains in instructive competence; and what roadblocks exist in the implementation of total quality in education.

History

Until the mid-1970s, the theories and practices detailed under the concept of TQM were relatively unknown in America. At this time, U.S. manufacturers were beginning to see their consumer base move toward other producers and their profits disappear. The Japanese were able to produce higher quality items for less cost, ultimately gaining the attention of consumers worldwide. It wasn't until the National Broadcasting Company (NBC) aired the now famous documentary, <u>If Japan Can, Why Can't We?</u>, that American corporations began to refocus on total quality concepts (Bonstingl, 1992:4).

Due to the destruction of much of their industrial base, Japan was unable to compete in the global marketplace after World War II. Poor workmanship and unreliable parts caused the other countries of the world to reject the products that Japan exported. W. Edwards Deming's ideas were greeted with open arms from this tiny country that was attempting to reconstruct their industries and reinstate their position in the world marketplace. Deming arrived in

Japan after the American manufacturers, who were overconfident because of their international dominance, ignored his suggestions to improve their productivity and profitability (Bonstingl, 1992:4).

Three decades later, it took a television documentary to show the nation what had happened. Corporate America's parochial arrogance had allowed Japan to take over the lead in the international market. Slowly, the ideas of continual process improvement and worker interaction, that Deming had presented years earlier, began to take hold. As organizations began to see the benefits that went along with these ideas, the number of followers began to increase. Recent reports indicate that "76 percent of companies now see quality as a major goal and 80 percent of the Fortune 1,000 firms have quality improvement programs" (Bowman, 1994:129).

Principles of TQM

Defining The Customer. In discussing the finer points of Total Quality in education, there are only a few points which can create a heated discussion, they concern the word "customer" (Ewell, 1993:54). In past decades, quality was defined by what the producer said it was; in industry, it was the absence of defects (Marchese, 1993:11). Today, the concept of quality takes on a new meaning. Quality is what

the customer says it is. The objective, whether in the corporate world or in the educational environment, is to provide goods or services that meet or exceed customer requirements. It is when the term "customer" refers to the student that the debate heat up.

There appears to be little controversy about this label when applied to situations in which students are the direct consumers of campus services such as health care, food service, library assistance, and even registration processing. Indeed, as consumers with particular wants and means, the students (and their parents) make the initial "purchase decision" to attend this university or that college (Ewell, 1993:54). However, once inside the institution, the term customer takes on a new meaning. The student now becomes a "raw material" of a specified process or production (Ewell, 1993:54). When the term is applied in classroom instruction situations, faculty can become sensitive. Instead of simply being raw material shaped by its maker, the student now is a contributor to his or her own production. Some faculty interpret this as a surrender of a certain amount of their expertise and authority to the student. In effect, they lose a little control over their ability to influence the class. Under old paradigms, professors were annoyed with students who questioned the structure of the class, and cooperative learning was not

encouraged. At one time, the motto was, "We're here to teach you how to think, not what to think" (Sowell, 1989:15). Today, more courses are designed to teach the student what to think; they serve the needs and desires of the instructor rather than the student.

A customer focus forces an organization to specify the consumers it serves. Customers are generally the ultimate users of the goods produced or service provided. There usually is no question who the customer is, and, once identified, the customer can express his or her needs (Dresner, 1994:14). However, this concept becomes convoluted when discussing the customer-student. In education, the student is undoubtedly the main recipient of the education product, but he or she may not be the ultimate user of the commodity. In this case, who is the customer? The answer to this question lies in the level of the process where the question is posed.

Academic institutions differ from profit organizations in that they generally have a far greater range of "stakeholders" (Matthews, 1993:105). Primary, secondary, and even tertiary stakeholders need to be identified. Different stakeholders will view the product differently, and each institution must determine its own hierarchy of stakeholders. Past, present, and future students represent first-level stakeholders. This is so because they are the

most direct recipients of the education product. They are
the customers for the most visible aspect of the
institution's activities (Matthews, 1993:105).

Any source of financial support must also occupy a
first-level stakeholder. Parents, students, endowment
donators, and companies who sponsor scholarship students all
represent valid stakeholders. Even the state represents a
first-level stakeholder if the institution in question is a
state school, as is the nation if Academy or DoD sponsored.

Second-level stakeholders are represented by the
administration and the faculty. The administration is
charged with administering to the needs of the primary
stakeholder, while the faculty are the providers of the
program.

Finally, tertiary stakeholders are represented by the
companies which hire the graduates, the local community
which inevitably employs the students, and boards of
trustees who benefit from school reputation and continued
enrollment success.

It is important to note that, while each of these
stakeholder groups has its own interests, it must be aware
that its needs may have to be subordinated to those of the
primary or secondary stakeholder (Matthews, 1993:106).
Without the primary stakeholder, the student, neither the
secondary nor tertiary stakeholder even needs to exist.

This is even further complicated when one examines the education system in the DoD. Here, the student undoubtedly should represent a first-level stakeholder for all the reasons illustrated above, but the DoD plays a more critical role. It not only represents the student's sponsor, but also the provider and the employer. Furthermore, the DoD is much more intimately involved with the product's outcome. It receives the most direct value for the time and dollars it invests in the educational experience.

Encouraging Employee Involvement and Empowerment.
Articles on TQM regularly profess the virtues of employee participation. Any business that strives to continuously improve must also empower its employees and promote teamwork (Scott & Palmer, 1994:140). Instead of relying on traditional hierarchical structures that capitalize on regularity and control, the total quality concept emphasizes top-level managers' roles as directors who facilitate the process, while empowering people to make decisions where the work is done (Ewell, 1993:52). Improving cooperation and developing teamwork are major priorities for any organization working toward a total quality environment. This same philosophy is true in academia (Potocki & Brocato, 1994:70).

As the instructor's role evolves from classroom director to empowerer, student autonomy increases, resulting in a revitalization of the educational process. The best managers are those who demonstrate the skills of a good coach. They are able to motivate their teams by communicating the big picture and showing the individual how he or she fits into the end result. At the same time, they must create an atmosphere of openness that encourages new ideas and allows the creativity of all team players to come forward (Ewell, 1993:52).

Efforts to find alternatives to the hierarchical approach used in many college classrooms have led a growing number of educators to turn to collaborative, group based activities (Presutti, Buzzi, & Heckman, 1995:135). This style of teaching is sometimes referred to as cooperative learning. Cooperative learning is a strategy that allows students to become more actively involved in the learning process:

> Students working together to get a job done in a classroom where students are concerned about each other's learning in addition to their own is at the heart of cooperative learning. (Johnson, Johnson, & Smith, 1993:11)

The use of cooperative learning helps students develop their team building skills. This is increasingly important to employers who are looking for well-rounded students. As

more firms turn to the total quality philosophy, teamwork is proving to be a mainstay technique.

Due to the multi-disciplined coursework many students experience today, eliminating barriers between academic disciplines is another especially important part of team building. Point nine of Deming's philosophy of management (see attached appendix) advises that breaking down barriers between staff areas is essential (Walton, 1986). With an increasing number of students seeking degrees which require coursework that crosses academic disciplines, teamwork in interdisciplinary majors becomes even more crucial. Positive interdependence is a key element characterizing cooperative learning in curriculums that use common rewards and resource dependency to demonstrate the importance of teamwork and the need for cross-functional collaboration to complete a task (Presutti, Buzzi & Heckman, 1995:139). Pedagogical approaches that promote the use of cooperative learning and the principles of total quality management to demonstrate the importance of the integration of knowledge make for a more meaningful educational experience for both students and faculty.

Benchmarking. Introduction of TQM into education falls into the same category as any other industry. Unsatisfied parents, students, and employers will force higher education

to do what it does better and for less money in the foreseeable future (Ewell, 1993:50). Education, like industry, must adapt to changes in the environment. Frederick Winslow Taylor taught American manufacturers to view each of their employees as "a cog in the giant industrial machine, whose job could be defined and directed by appropriately educated managers, administering a set of rules" (Bonstingl, 1992:67). This thought process worked well under the assembly line mentality that was beginning to grow in America. As times progressed and manufacturing changed, business practices slowly adapted, as well. The concepts that Taylor demonstrated to American manufacturers- pushing the product out the door as a top priority and catching defects at the end of the system- slowly made their way into the educational "industry." Americans have grown accustomed to the fact that 25 percent of their students are not going to graduate, instead dropping out for future "re-work" or simply to be "discarded" (Likins, 1993:20).

There are numerous documented cases of successful TQM projects (e.g. Motorola, Proctor & Gamble, and Xerox) that have won some of the most coveted awards ultimately improving their productivity and profitability (Brigham, 1993:42). This foundation of success provides a roadmap for future companies to use as they attempt to implement TQM in their organizations. Some organizations have established

guidelines, while others have created new processes that could be adapted to fit into another company's future plans. The main reason for the use of this benchmarking effort is the numerous failures that previous TQM practitioners have encountered. Current surveys and research are indicating that TQM is failing to reach the promised level of returns. The research firm of A.T. Kearney reports that only 20 percent of those surveyed believed that TQM had produced any "tangible results." By examining where other firms have failed and emulating the actions that the successful businesses have taken, TQM newcomers are likely to increase their odds of succeeding in their efforts (Brigham, 1993:42-43). Benchmarking is the "systematic search for best practice" (Marchese, 1993:12). This concept requires an organization to identify a key process and track down the business that performs that task in the best manner, regardless of the industry.

Some believe that the quality revolution will not prove successful in the educational environment because of the number of failures inherent in the corporate world and the fundamental differences in the two industries. According to Lt. Col. David Porter,

> [those concerned] should be much more upset by the realization that the assembly line assumption of traditional American industries worked their way into our pedagogy and curriculum without notice over the last few decades, than fearful of what the application

of Total Quality might do in the future. (Porter, 1993:5)

TQM success stories, in both business and education, provide a tool which schools that are beginning and developing their systems can measure themselves against and strive to reach. Every organization is unique, and any idea, system, or process borrowed from another industry or school must be adapted and pooled together to fit the situation that applies.

Quality in Academia. Since the first forum dealing with TQM in 1989, an increasing number of institutions of higher education have begun to apply the ideas in teaching and administrative processes (Presutti, Buzzi & Heckman, 1995:135). Efforts to bring total quality principles into universities fall into two main areas: administrative and instructional methods within the classroom.

In universities attempting to construct a total quality project, the effort begins in areas outside of the classroom. The examples of Iowa State and Oregon State Universities describe a method that many other colleges are following. Both ISU and OSU "began in the nonacademic, functional units of business, finance and administration." Many universities are choosing this method of implementation because their profit motives are linked more closely to

industry than to the non-profit curriculum and instructional side of academia (Walker, 1995:103).

Bringing quality methods into the classroom is not as easy a task. The principles and theories of business do not cross over as directly. Use of daily evaluation of instructors by students (Froiland, 1993:52), partnerships with successful businesses, such as ISU's teaming up with Texas Instruments (Walker, 1995:103), and making the teacher not only the deliverer of information, but also a facilitator and researcher who is constantly determining effectiveness of teaching methods (Scott: 139), are all examples of successful transitions in the academic world.

With both methods of implementation, there will be inevitable difficulties due to people's inherent reluctance to embrace change. This is especially so with faculty members who become skeptical of the impact that TQM will have on their academic freedom (Walker, 1995:103). The skepticism and lack of support in academia is no different than the challenges faced in industry, and the same methods must be used to fight employees' fears. TQM education, employee development and involvement, benchmarking, and empowering employees are all methods used to mitigate these fears (Dresner, 1994:16; Foggin, 1992:8; Matthews, 1993:105).

It was clear from our research that numerous universities were devoted to the introduction of TQM into their programs. Many examples of improved administrative and financial departments, and better methods of evaluating instructors, along with better approaches to improving course content and delivery were discovered. However, few examples of what was being done to actually provide the student with TQM information, or at teaching them how to comprehend and apply the principles of total quality were found.

Roadblocks. While most of the articles that we reviewed boasted of great returns and improvements in the university that adopts TQM, the most prevalent concern was that of potential roadblocks to successful employment of TQM. Without a concerted, visible, and constant dedication to making the total quality mentality a part of the organizational culture, any effort is doomed to fail. According to the first of Deming's 14 points, leaders must "create constancy of purpose for improvement of product and service" (Bonstingl, 1992:7). Although the concepts of defining the customer, empowering the employees, benchmarking, and so on could form hindrances when introducing quality into the educational organization, it is top management's responsibility to insure that TQM

initiatives are correctly implemented. "In education, school leaders must focus on establishing the context in which students can best achieve their potential through the continuous improvement of teachers' and students' work together" (Bonstingl, 1992:7).

Some factors that can impact the transition to total quality are as follows: managers must be willing to relinquish vital elements of control to their employees if they are to truly be empowered; the team must recognize that the speed with which decisions are made may be slowed because what was once a singular management decision now becomes a team decision; and egos and personal holds on power must give way to staff development and recognition (Dresner, 1994:16). "Without executive leadership setting the strategy and championing the cause, TQM efforts suffer, moving in fits and starts that ultimately can drown out even those units or teams that have produced impressive results" (Brigham, 1993:44).

At the other extreme, management can be overly fascinated with the recognition achieved by earning any of a number of national TQM awards. One such award is the Malcolm Baldridge National Quality Award. Many criticize this award for its ability to be bought by the company most willing to invest the time and dollars necessary to win the battle. "Many companies hire consultants who specialize in

getting you through the process. Faultfinders point out that even if you forego the consultant, you still need legions of frenzied people who must work thousands of hours to comply with the mind-numbing set of evaluation procedures" (Austin, 1993:22).

The process of change can be difficult for anyone to accept. There is definitely something to be said for comfort in familiarity, and this concept is, unfortunately, the one most often chosen in academia. However, despite the roadblocks inherent in implementing the changes required by total quality, the rewards far outweigh the drawbacks.

Summary

The American corporate industry has realized that the consequences of providing a poor quality product are liability, low productivity, high costs, and the loss of customers. "Failure to devote adequate attention to quality can damage the organization's image and lead to a decreased share of the market. . . [and] increased criticism and/or controls" (Stevenson, 1993:99). Educational institutions are now beginning to feel those same pressures that forced business organizations to implement quality initiatives in their operations. The students are not satisfied with the education that they are provided with, the parents are unhappy with the high cost of a university education, and

the businesses who ultimately employ the graduates are unimpressed with the level of corporate knowledge that they bring to the job.

After having reviewed many of the current articles regarding total quality, there appears to be no lack of discussion over the topic of TQM in the halls of America's higher education institutions. Indeed, never before has there been such an unprecedented amount of scrutiny and attention given to the pedagogy of classroom instruction. Debates over the best location to integrate Total Quality Management- whether in the administrative functions or in the classroom- were commonly discussed by authors. Quality principles such as customer focus, empowerment, continuous improvement, and benchmarking, along with how the educational area should make the transition were discussed at length. There was also a great amount of debate over the areas in which roadblocks would surface during the introduction of quality concepts. Furthermore, it should be noted that there is a dearth of information available on the ability to introduce coursework changes in already established curriculums.

Many journal articles, case studies, and field experiments offer advice on how best to begin the quality journey, albeit much of this information is misleading and inadequate at best. Many authors espouse the use of

benchmarking as a starting point or example to follow; however, the trouble with this suggestion is that there is little documentation available to guide this endeavor. Universities looking for examples of successes and failures of other quality programs will not find many published examples, but will be forced to rely on their own contacts with leading schools.

III. Methodology

Chapter Overview

The research presented in this thesis is intended to
assist DoD university-level efforts in providing curricula
that incorporate total quality principles. A comprehensive
examination of the efforts initiated by other universities,
both civilian and military, was used to determine which
total quality processes are successful and which provide
overall benefit to the customer.

Due to the fact that this is a follow-on study of
research first initiated in 1993 by Bond and Shimel, much of
the same methodology was used in order to provide
consistency and a parochial view of the data obtained. The
research stream provided by current literature demonstrated
many of the same limitations first discovered in 1993. This
is especially true in the area of the literature review.
While an enormous amount of information on general campus
applications of quality is available, there continues to be
a dearth of articles providing specific guidance for those
DoD institutions searching for direction in developing their
own total quality education programs. Because the
information required for our research continues to be
lacking in current publications, the methodology used here
is consistent with that of the original research;

information is obtained directly from the institutions interviewed.

The chapter will present a detailed description of the methodology used to conduct this research effort. The research design is presented, followed by a description of the population, sample selection criteria, and instrument development. Procedures for data collection and data analysis are then described.

Research Design

This qualitative research effort attempts to identify the most effective practices that academic institutions have used to implement total quality education initiatives in their curricula. A combination of military academies, civilian universities, and professional military education (PCE) schools were used to develop a full perspective of how all areas of higher education approach this subject and to gain the widest possible sample of relevant information.

Telephone interviews were conducted with personnel at these particular universities, which appeared to have integrated TQM to the greatest extent. Department heads, administrators, and instructors were the primary interview subjects due to their familiarity with both total quality principles and their particular university's involvement with the process.

Population Sample

The population of interest consists of all government and civilian academic institutions that have introduced total quality education into their curriculum teaching methods. The review of recent literature showed that, while the majority of academic institutions have attempted to implement TQM at some level, only a few have been recognized as successful and have established themselves as potential benchmarks in this area. Furthermore, identifying institutions that have established guidelines for total quality implementation has further narrowed the sample.

In order to maintain a manageable the scope for the research, we selected an initial sample from a September 1995 Quality Progress article, which provided a list detailing the TQM implementation level of over 200 civilian universities. Another method utilized in selecting universities for the study was word-of-mouth recommendations (this was especially true with military institutions). The final listing of institutions that were contacted for their input into the study is as follows:

> Air University, Air Force Quality Institute
> Air University, Air Command and Staff College
> Air University, Air War College
> Cornell University
> Iowa State University
> Kansas State University
> Kansas Newman College
> San Diego State University

United States Air Force Academy
United States Naval Academy
University of Miami
University of Michigan
University of Texas, Austin

Instrument Development and Testing

Data Collection Method. Due to the qualitative nature of data collection, several requirements and certain limitations became evident. Telephone interviewing was the method utilized as the primary data-collection technique. The following requirements pointed us toward this method of data collection:

1. The qualitative nature of the research required unique answers from each individual university.

2. The focus was the depth of the answers, rather than the number of responses.

3. The flexibility was required for redirecting questions and addressing areas not covered in the questionnaire.

The use of a person-to-person interview provided the ability to satisfy all these requirements. Under the classification of a person-to-person interview, several options, such as face-to-face, telephone, and through-the-mail interviews become available. However, direct face-to-face and through-the-mail interviews were not reasonable alternatives. The following limitations were considered in our data-collection technique:

1. Limited time and funding would makes face-to-face interviews impossible.

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2. The interaction and flexibility required would rules out mail surveys.

Telephone interview techniques satisfied all requirements of our research and were not affected by the limitations listed above.

Instrument Development. The intent of our research was (a) to determine the processes that various universities have initiated in order to provide their students with the ability to comprehend and apply total quality principles in their fields of study, and (b) to compare how these developments have been improved upon since the previous research effort. Specific investigative questions had to be developed in order to accomplish this intent. The following investigative questions were borrowed from the 1993 thesis in order to assure that accurate data could be collected and a direct comparison could be provided:

1. What curriculum development methods are these institutions using to provide students with the ability to comprehend and apply total quality principles in their fields of study?

2. What course construction and delivery methods are these institutions using to provide students with the ability to comprehend and apply total quality principles in their fields of study?

3. What feedback methods are these institutions using to measure the success of their programs in achieving the objective of providing students with the ability to comprehend and apply total quality principles in their fields of study?

4. What are the general strengths and deficiencies of these processes, as observed by these institutions?

In order to satisfactorily answer the investigative questions, the previous researchers created a list of measurement questions. Measurement questions are those which are typically asked of respondents (Emory, 1991:79). These measurement questions became the basis for the questions that were ultimately included in the telephone interview survey.

Bond and Shimel created their survey so that initial questions required relatively straight-forward responses. Subsequent questions became more complex and required greater thought and depth of analysis. This pyramid approach was devised in order to ease the interviewee slowly into the subject matter, while progressively narrowing the focus and broadening the depth of the information being sought. The survey was designed to generate discussion of the institution's total quality program, rather than simply to elicit responses to specific questions.

Furthermore, the length of the questionnaire was considered as a potential limiting factor. The interview as originally created by Bond and Shimel was planned to last approximately one hour. Although there is no record of any problems encountered with this lengthy interview, it is our desire to keep the interview to no more than one half hour.

To facilitate this, all institutions were originally contacted by telephone, and a primary point of contact was identified. A hard copy of the interview was mailed to the respondent, either through the United States Post Office or electronic mail. They were asked to review the questions, and a follow-on time for the interview was confirmed. All respondents were asked for permission to record the interview in order to further speed the process and improve efficiency and accuracy. A copy of the telephone survey questionnaire used for the interviews is included in Appendix B.

Instrument Testing. The original survey was tested in 1993 when Bond and Shimel gave the interview to four instructors located at the Air Force Institute of Technology. These initial interviews were used to determine if the original survey's construction was clear, concise, and capable of providing an accurate tool for data collection.

The original survey was updated for this research, and minor revisions and additions were completed. The revised telephone survey questionnaire was validated once again by interviewing three instructors at AFIT and the director of the quality office located at Air Force Materiel Command, Wright-Patterson AFB.

In both stages of testing, the respondents were briefed upon initial contact and at the time of the test interview to determine the clarity of the questions and their ability to retrieve the desired information. Although provisions were in place to do further testing if necessary, only minor corrections and additions were suggested. It was determined that, with little additional development, we should proceed with the telephone interviews.

Summary

The survey and research technique that was developed within the methodology section provides an ability to present an in-depth case study of how several academic institutions provide their students with an ability to comprehend and apply total quality principles. The findings and analysis of this research are presented in Chapter IV.

IV. Findings and Analysis

Introduction

Thirteen interviews were conducted between 30 April 1996 and 2 July 1996. School selection was based on information that identified the leaders in establishing quality curriculums in American higher education. The individuals representing these leading schools were, in some capacity, influential in their program's development or administration.

The survey instrument used in the interviews was divided into four distinct sections. The sections are as follows: a) curriculum development, b) course development and delivery, and c) Feedback methods, general issues (including perceived strengths and weaknesses along with future plans). Each section was designed to represent both a significant aspect of quality instruction by the institution and the ability of the students to participate in the instruction. Each interview attempted to determine what pedagogical processes the school used to provide students with the ability to comprehend and apply total quality in their fields of study.

Each interview was recorded (with the permission of the interview respondent) and transcribed as an interview summary (see Appendix C). The duration of the interviews

ranged from 30 to 120 minutes. The analysis of the interviews is provided in the following section. The results of the research follows.

Curriculum Development

Seven questions concerning curriculum development techniques were asked of the survey respondents. The questions were designed to elicit information about the curriculum development methods and practices employed by the participating institutions in order to enable students to comprehend and apply total quality principles. The following section presents a discussion of some of the results of these questions.

Does your school offer a major in Quality Management? Each institution in this study offered some form of quality education or training. The programs varied from ones offering little instruction to those which offered several degree options in Quality Management. Responses to this question were even more varied because 5 of these 14 institutions offered military education and training instead of traditional civilian higher education.

The diversity of the programs is best exemplified by the mission or charter of the schools. For example, the Quality Center at the University of Texas at Austin offers

"training" in total quality management. This training is given on a continuing-education basis. Fully employed adults attend seminars, which last from half a day to six days (Dunn). This same sort of training is offered at the Air Force Quality Institute at Air University. Here, the school's primary focus is "Just-In-Time" training rather than the "Just-In-Case" education received in other Air Force Professional Military Education (PME) courses (Thomas). Although no formal majors or degrees are offered at either of these institutions, credit is given for the courses, which may merit certificates of completion. It is the belief of these schools that the knowledge gained at this sort of quality training will someday prove valuable in a future position.

On the opposite end of the spectrum, the majority of the civilian schools offered a range of opportunities for participating in quality education. At a minimum, **formal classes or core electives in quality** (survey question #2) were offered at all schools. Specifically, at the undergraduate level, Kansas Newman College offered an undergraduate minor, an A.S., and a B.S. in Total Quality Management (Stanley), while the University of Miami offered an M.S. in Quality Management, an MBA specializing in quality management, and an opportunity to specialize in quality at the Ph.D. level, as well (Gitlow). The military

offered its own version of quality education, which was as varied as its civilian counterparts. Air University's Air War College offered a significant portion of quality instruction at the senior officer level. Courses offered here centered on the development of leadership skills and tools (Ashley). On the other extreme, the United States Naval Academy had replaced all instruction on quality principles with courses on ethics (Roush).

It is important to note that at several institutions- most notably, the United States Air Force Academy and the University of Michigan- the integration of total quality management was sought in all courses regardless of subject matter. It is the philosophy of these schools that quality education should be a part of the entire academic experience rather than compartmentalized into specific classes (Lowe/Kurta).

While the general consensus was that no particular advocate or approach was focused on at the schools, it was clearly obvious that the schools continuously compared their programs with the management philosophy espoused by Dr. Deming. Apparently, this was the case because many of the instructors and department heads were advocates of Deming's management style.

Does your institution have any formal or informal guidance for curriculum construction and content? While it appeared that most institutions provided some form of guidance (formally or informally) for curriculum construction and content, few relied on a formalized system for introducing curriculum changes or new course constructions. Furthermore, few actually listed any requirements that provided specific guidance for teaching students to comprehend and apply quality principles. Here again, the schools applied various approaches. While no formal guidance existed at Cornell University, University of Michigan, and San Diego State University, these schools generally allowed their faculty or departments to mold their own courses and curriculum. For instance, the curriculum model at San Diego State University mainly emphasized the academic departments as the initial generators of curriculum proposals. All curriculum proposals were sponsored at the department level, flowed out of the academic departments to the college level for evaluation, and eventually went to the university level for review and curriculum adoption or denial (Bailey). This was generally true of the systems used at both Cornell and the University of Michigan, as well.

Additionally, the College of Engineering at Kansas State University followed the recommendation of the external

accrediting board when developing curriculum construction
and content. Internally, the faculty senate provided
guidance (Hightower). At Kansas Newman College, a
collaborative decision making process allowed all academic
parties to contribute to the course addition or modification
(Stanley).

This process was significantly different in the
military institutions. First, formal guidance for
curriculum construction and content at the undergraduate
level at United States Air Force Academy originated at the
Center for Educational Development. This office provided
formal guidance for development of curriculum, lectures, and
examinations (Lowe). Formal guidance for curriculum
construction and content at other Air Force PME institutions
is detailed in the Instructional Systems Development (ISD)
Model. This model, used by the Air Force Quality Institute,
Air Command and Staff College, and Air War College, includes
five phases for development of curriculum and application
for their respective management aspects. The five phases
are Analysis, Design, Development, Implementation, and
Evaluation. The model is detailed in Air Force Manual (AFM)
36-22-36, Guidebook for Air Force Instructors, and AFM 36-
22-34, a fourteen-point instructor's handbook. These guides
provide information for curriculum construction in any area,
not just in quality.

The chart, located at Figure 1, depicts the Quality

Leadership Architecture currently employed by the USAF. It

illustrates the responsibilities at the various levels of

Professional Military Education.

	Junior Officer	Mid-Grade Officer	Senior Officer	Executive Officer
Grade	O1 - O3	O3 - O4	O4 - O5	O6 and above
Development	Initial Development	Intermediate Development	Advanced Development	Executive Development
Roles and Resistibilities	Job Knowledge, Team Member, Project Officer	Base Level, SQ/WG Staff, Team Leader, Supervisor, and Process Owner	Unit Commander, HQ/Joint Staff, System Manager, Change Agent, and Quality Advisor	Commander, Strategist, Policy Maker, Change Architect, and Public Figure
Organizational Level	Tactical Level	Tactical Level	Operational Level	Strategic Level
Level of Learning	Knowledge, Comprehension	Comprehension, Application	Comprehension, Application, Analysis	Application, Analysis, Synthesis
PME	Commissioning/Tech Training	SOS	ACSC	AWC
Leadership	Understand Mission and Vision	Tactical Mission Linkage	Operational Mission Linkage	Strategic Mission Linkage
	Core Quality Fundamental and Philosophy	Core Quality Fundamental and Philosophy	Transformational Leadership	Visionary Leadership
	Set Priorities	Set Tactical Priorities	Set Operational Priorities	Set Strategic Priorities
	Core Values	Core Values	Core Values	Core Values
	Quality in Daily Operations	Coaching/Mentoring	Mentoring	Institutional Mentoring
	Principles of Leadership/Followership	Quality in Daily Operations	Quality in Daily Operations	Quality in Daily Operations
		Practice of Leadership/Followership		
Customer Focus and Satisfaction	Customer/Supplier Focus	Customer/Supplier Relationship	Customer/Supplier Relations Mgmt	Customer/Supplier Relations Mgmt
Strategic Planning	Action Planning	Action Planning	Leading in the development and implementation of Strategic Plan	Leads in development and Implementation of Strategic Plan
	Organizational Assessments	Organizational Assessment	Organizational Assessment	Organizational Assessment
	Fundamental of Strategic Planning	Strategic Plan		
Human Resource Development and Mgmt	Rewards and Recognition	Team Dynamics	Develops/Implements Human Resource Plan	Develop Human Resource Policy
	Work Force Professional Development	Human Resource Programs		
	Performance Evaluation and Assessment			
	Team Roles and Responsibilities			
	Group Dynamics			
Process Mgmt	Key Processes	Key Processes	Process Improvement	Process Improvement
	Process Analysis	Process Analysis	System Thinking	System Thinking
	Creative and Innovative Thinking	Creative and Innovative Thinking	Creative and Innovative Thinking	Creative and Innovative Thinking
	Continuous Improvement	Systems Thinking		
	Tools and Techniques	Tools and Techniques		
Information and Analysis	Comparisons and Benchmarking	Process Comparison and Benchmarking	System Benchmarking	System Benchmarking
	Process Performance Indicators and Metrics	Process Performance Indicators and Metrics	System Performance Indicators and Metrics	System Performance Indicators and Metrics
	Data Based Decision Making	Data Based Decision Making	Data Based Decision Making	Data Based Decision Making
Performance Results	Performance Analysis	Tactical Performance Analysis	Operational Performance Analysis	Strategic Performance Analysis

Finally, several of the civilian programs relied on instructional models developed by corporate America. Two of the more predominate models were used by the University of Miami and the University of Texas. At Miami, courses in quality used the Systematic Instructional Design Model developed by the Motorola Corporation for curriculum construction and content. This design involves taking quality experts, as well as quality practitioners, and grouping their main ideas in affinity diagrams. These diagrams are analyzed and course and curriculum decisions are made based on this analysis. The 12 core courses offered in the M.S. program at Miami were developed in this manner (Gitlow).

Courses taught through the University of Texas' Quality Center were based on the Xerox quality training model, which emphasizes approaches advocated by Deming, Crosby, and Juran (Dunn).

What changes have been made to the general curriculum structure to teach students how to apply total quality principles? Most of these schools have made program changes. The majority of the respondents referred to these changes as a natural evolutionary cycle that allows the programs the necessary flexibility to meet the needs and desires of their customers and stakeholders. At Kansas Newman College, the quality degree has just finished its

sixth year. The program was originally inspired by a request from Boeing, which asked for proposals from academia to work jointly on creating a quality degree. The early years of the program focused heavily on the military side of Boeing airplane operations. The school realized that the program was too parochial and created a TQM advisory committee using members from the local business community. The committee's advice has molded the program into one that focuses on broader issues than just those found in the U.S. airplane industry (Stanley). Staying with the theme of cooperation between industry and academia, both the University of Michigan and Iowa State University have implemented changes that focus the students more on industry and less on the blackboard. At Iowa State University, the engineering curriculum has attempted to add more quality instruction earlier in the academic cycle. First- and second-year students are now exposed to classes and concepts that once only third- and fourth-year students experienced. These changes were a direct result of the school's partnership with Texas Instruments (Kurta).

Military education has taken a somewhat different approach to this evolution. Generally speaking, military schools have been devoting less time, money, and human resources to the teaching of quality. Major changes in the Air War College quality curriculum revolved around the fact

that students were arriving with a basic knowledge and understanding of quality, which was once absent in new students. Currently, fewer hours are being spent teaching quality, but more time is being spent promoting the positive use of quality. The focus is on the Strategic Planning Model. Students are being taught to be open to new ideas. The resultant leaders should be able to demonstrate positive attitudes toward areas in which they were once skeptics (Ashley). At Air Command and Staff College, exposure to quality in the classroom has become less prevalent than it was three years ago. Today, the general curriculum focuses more on leadership and the leader's ability to be an advocate for his or her quality team. There is also more emphasis placed on the student's ability to synthesize and analyze situations (Johnson).

Perhaps nowhere are changes in quality curriculum more obvious than in the Air Force and Naval academies. As an institution, the United States Naval Academy has eliminated all courses dealing specifically with quality. Students no longer receive any formal education on total quality. The classes that were canceled have been replaced with courses dealing with ethics. Ethics, as a subject, is taught both through individual specialized courses, and by weaving ethics topics into other core-curriculum courses. At the U.S. Naval Academy, the areas of emphasis have changed along

with changes in administration. According to Dr. Roush, the school's current leadership feels that total quality management classes were over-emphasized, and students were being force-fed at the institution. They believe that quality training should be accomplished after graduation at the unit level rather than at the undergraduate academy level. Changes at USAFA have been less dramatic but equally encompassing. Changes here include the integration of more total quality instruction in all core classes. It is the intent of the USAFA to make quality a part of the everyday academic experience for all students, whether they are in Organizational Behavior or Physical Science courses (Lowe).

Which specific departments or disciplines have most actively adopted quality education initiatives? There was no discernible pattern in the responses to this question. The individuals interviewed could answer the question in one of two ways. First, they could view the departments that they represented as the ones that most actively adopted quality education initiatives. For most respondents, it was their departments that were responsible for introducing quality into the academic curriculum, but they were not necessarily the ones that practiced it best; in other words, they may not always be practicing what they preached. Second, they could look at the university holistically and

assess which departments or university functions best demonstrated quality concepts.

For Cornell University, the Operations Management department had most actively adopted quality education initiatives (Thomas). At both the University of Miami and San Diego State University, the Management Department and the Information Decision Systems Department were most active (Gitlow & Bailey). Kansas State University and University of Michigan were active implementors of quality in their Architectural Engineering/Construction Science Department and the School of Engineering, respectively (Hightower & Kurta). At Kansas Newman College, the University of Texas, and Iowa State University, the most active implementors of quality were in university services such as the business and finance offices, administrative services, and mail and supply services (Stanley, Hetland, & Dunn).

What guidelines do you have to teach across disciplines or offer multi-disciplinary courses? The trend to teach across disciplines has continued since the original 1993 research was completed. Cross-disciplinary and multi-disciplinary courses continue to be a mainstay for many institutions seeking to broaden the base of their programs. For many programs, like the ones offered at Kansas State University and Kansas Newman College, no actual guidelines

exist. Instead, cross-disciplinary teaching has become such an ingrained part of the education process that guidelines are no longer necessary; crossing disciplines simply occurs naturally (Hightower & Stanley). The same is true of Cornell University. Although no guidelines exist, a core curriculum coordination committee looks at concepts and processes that are inherently compatible with cross-discipline teaching (Thomas).

At the USAFA, one area that has especially adopted cross-disciplinary teaching practices is Operations Research. The degree offered here requires that the student gain a base education from several separate departments. The Operations Research program views itself as having several separate clients: students, the Operations Research discipline itself, and the scientific analysis career field in the active Air Force. As the school assesses the strengths and weaknesses of its programs, it becomes harder for the individual departments to ignore the opportunities they can gain from sharing teaching responsibilities. This philosophy is becoming so ingrained at the academy that departments now set goals and outcomes so that all departments are able to compare their curricula with each other (Lowe).

The University of Michigan offers a simpler, more direct approach. Although no guidelines exist for teaching

across disciplines, the instructors move from one department to the next to fill the needs of other programs. To maintain an even class size across the institution, the instructors follow the student demand for classes (Kurta).

At Iowa State University, multi-disciplinary courses are available to the students, especially at the graduate level. Although Iowa does not offer an M.S. in quality, it allows students to choose courses across departmental lines, giving them the flexibility to design their own degrees. Several courses in statistics, organizational behavior, and other quality related topics are open to students who have the desire to take these courses (Hetland).

Although guidelines to teach across disciplines or offer multi-disciplinary subject material remain much as they were in 1993, informal guidance- in the form of verbal directives- originates from the Commandant of Air University (Johnson). Because students take the same courses at ACSC, no cross- or multi-disciplinary courses are offered. At ACSC, the promotion of quality is present in all five departments at Air War College. At this institution, the Leadership and Ethics department is the dominant player in introducing quality into the classroom. The department's agenda is presented across the curriculum and is apparent in the curriculum of all five departments. Conversely, the other departments have a specific amount of time when they

are in charge of the classroom, and their course material rarely spills over into the other departments (Ashley).

To what degree do students participate in general curriculum or program development? Opinions on the degree of student participation in curriculum and course development vary greatly among the respondents. While some universities continue to allow and encourage student participation, others completely refute the merits of this student interaction. Many of the respondents viewed student feedback (which is discussed in the subsequent section) as the main avenue students have for influencing course design (Thomas). Others believed that students lacked the knowledge and experience required to make rational, sound contributions to curriculum development (Hightower, Kurta & Gitlow).

At Kansas State University, student participation takes a somewhat different approach. The opinions of alumni are more influential to curriculum development; they have not only completed the program, but are now a part of the business world and thus are able to assess the needs and desires of that community and to weigh them against the needs and desires of current students (Hightower).

At some schools, enrollment in classes plays a factor. If students do not enroll in a particular class, it is

assumed to be unpopular and a redesign or removal of the course is considered (Lowe).

Two distinct exceptions to the above policies were discovered at both the University of Texas and Air War College. At the University of Texas, students contribute to course development through the use of strategic planning accomplished at the beginning of the seminar. Students are given the opportunity to brainstorm about which areas they feel need to be covered the most in the training. One reason this is so successful at Texas is perhaps because the programs offered at this institution are only a maximum of six days in duration (Dunn). At Air War College, students once were active participants in Process Action Teams, which attempted to determine what role quality ought to have in the AWC classroom. As was stated earlier, the current quality curriculum at AWC contains fewer hours of quality education than in the past. One way the school has attempted to overcome the lost quality training is by opening the lines of communication. Students can have a direct affect on the program through the school's "Valentine" system. This is an informal way of communicating directly with the Dean. Responses to Valentines are taken very seriously and are usually returned to the student within 24 hours. This real-time method of

involving students in course decisions has had a lasting success at AWC.

Course Development and Delivery

Questions concerning techniques of course development and delivery were asked of the survey respondents. The questions were designed to elicit information revealing methods and practices the participating institutions employed in order to enable students to comprehend and apply total quality principles. The following section discusses some of the results of these questions.

What changes have you made to any particular course or courses to teach students quality principles, applications or concepts? The answers received from this extremely broad, open-ended question all indicated that the changes that have taken place are too numerous to list. The Total Quality Management program at Kansas Newman College has been in existence for six years, and the number of changes even in the past year are impossible to list (Stanley). The majority of the schools interviewed stated that the answers in the other sections provide an understanding of the changes that have taken place to move them to their present point (Lowe, Kurta, Hetland, Stanley, & Thomas). Although this was the overriding feeling gained from the interviews,

it was not the result for all the institutions. Kansas
State University's TQM program has been slowly adapting,
with the majority of the changes dealing with organizing and
defining the structure of the courses (Hightower).
Conversely, the Naval Academy has focused all of its changes
on removing the topic of quality from the classroom (Roush).

**Have you used any one, or a combination, of the
following methods to teach students total quality
principles?** <u>Inviting Outside Employers to Talk to the
Students.</u> Although the University of Miami and the Naval
Academy only do so rarely, every school interviewed invites
outside employers to speak to the students. Kansas State
has been using this technique for years; the addition of
quality topics to the curriculum has just provided a new
audience to gain the business leaders' knowledge. At the
Air Force Academy, the Management Department has a seminar
course that is almost entirely presented by guest speakers,
and speakers are occasionally invited to address many other
classes (Lowe). Cornell has taken this concept to another
level. In addition to inviting CEOs and business leaders,
they have also invited the individuals who are actually "in
the trenches" doing the quality work in organizations to
discuss the difficulties realities of implementation that
are encountered (Thomas).

Several respondents mentioned that close ties to the local businesses provide them with a greater opportunity to organize these lessons and to integrate the business leaders into the course discussion. Iowa State University is involved in a partnership with Texas Instruments that provides a constant interchange between the two institutions. Texas Instruments sends speakers to present applications of the material, and Iowa State sends students to do basic consulting and documenting of Texas Instruments efforts (Hetland). Similarly, Kansas Newman gains the majority of their speakers through contacts set up in their employer-advisory council. This council of local businesses meets with school officials to discuss topics considered necessary for the students (Stanley).

Team Teaching. Another technique that is used to help provide students with the ability to comprehend and apply total quality principles is team teaching. This technique is the use of two instructors- from the same or different disciplines- to teach various lessons. This is done either to provide the students with differing viewpoints on the subject or to divide the material so that the expert in each area provides the instruction.

This technique has been used at most of these institutions, but not on a regular basis. At the lowest end of the scale, the Air Command and Staff College uses the

team teaching approach only in the planning process when organizing the course; the actual teaching is conducted by a single instructor (Johnson). Most other schools have integrated this technique more fully. At the Air Force Academy, team teaching is left up to the individual instructors. Lieutenant Colonel Lowe believes that it is an idea that would be accepted by the majority of instructors, but schedules and availability are limiting factors that keep it from becoming more prevalent (Lowe). The main roadblock to team teaching that is seen at Kansas Newman is the lack of financial support. Teachers using this approach would be forced to divide the salary that is paid for the course, rather than both receiving the regular wage. Ms. Stanley feels that the best use of this technique is when the class is attended by both instructors, which is discouraged by this pay method (Stanley).

Group Discussion Techniques. All the respondents commented that they used this technique often. Most of the classes at Air Command and Staff College are being taught in a seminar format, which requires students to share in the teaching process. Life lessons and real-life experiences are sought in this environment. It is not uncommon for the instructor to act simply as a facilitator (Johnson). The decision of whether or not to use this technique is left up to the instructor at Kansas State. Although the majority of

the instructors like the idea of group discussions, the set-up of the courses does not allow for the use of this technique. The instructors must determine if group discussions are beneficial in their particular situations or not. All of the faculty at Kansas Newman are trained in the techniques of leading group discussions. Ms. Stanley believes that students have about a twenty minute attention span. Getting them involved in the discussions lengthens this time and provides for a better learning environment. Because most of the students have experience in the field, so getting them involved provides relevant information that helps facilitate the learning process (Stanley).

Student-Team Exercises. Each of these universities has placed great emphasis on the importance of learning to work in teams as part of the overall effort in learning to apply quality principles. At the Air Force Academy, much of the team-building development is handled by the Behavioral Sciences Department. This effort is built upon in the Management Department through its use of team projects and case studies (Lowe). Kansas Newman has attempted to integrate this technique into as many courses as is feasible, and has developed one class in which the entire grade is determined by group activities.

Often, teams are used in real-life scenarios (which are discussed in the next section). Iowa State University has

several ongoing projects that integrate the use of student teams and real-life scenarios involving direct communication with local businesses. The best example of this is a present graduate level course of ten students (five in engineering and five in business) that work on a real-life problem Texas Instruments is facing (Hetland).

Real-Life Scenarios. Many universities have moved away from the traditional classroom lecture format of teaching courses and toward more hands-on, real-world applications. The real-life scenarios that are being presented to students include evolution of case studies, discussion of current events, completion of internships with local businesses, and analysis of previous experiences of both instructors and students.

As discussed in the previous section, Iowa State University has its students working on real-life problems at Texas Instruments. The students perform benchmarking, conduct analysis, and consult the firm on the results of their studies (Hetland).

The University of Michigan brings in real-life scenarios wherever possible for development of the total quality concepts. It attempts to bring examples from both industry and academia, so that the needs of all students will be addressed.

Integration of Quality Improvement Methods. While most
of the universities have offered formal classes on the topic
of quality, very few have been able to integrate this
information into other courses. The feeling of Mr. Hetland
at Iowa State University was mirrored by the majority of the
other respondents. He related that "the integration and
teaching of quality improvement methods from one course into
another is seen only on a limited basis. There is no real
structure designed to facilitate this transaction of ideas,
leaving most cross-over strictly consequential" (Hetland).

To what degree do students participate in course
development? None of these universities have used the
participation of students to help develop their courses.
The techniques that have been used to gather the students'
feelings are simply participation in decision-making
committees and other feedback methods (Stanley).

The University of Michigan previously attempted to
integrate student input on where they wanted the course to
go at the beginning of the semester. This was an
unsuccessful approach because the majority of the students
entering the class had little knowledge of the subject and
could not direct the development of the discussions.

Feedback Methods

Along with efforts to introduce quality principles into curricula, schools are also responsible for measuring how well students are comprehending and applying these concepts. Schools attempt to obtain several different kinds of feedback. Three such approaches are discussed here.

The first type attempts to gain insight into how well the students are learning the concepts presented to them by the school. It assesses what their knowledge level is and how well they have progressed through the program. This sort of feedback is typically gathered by testing and other university evaluations of the students. The students are responsible for regularly demonstrating how much they have learned and what command of the material they have. Proper command of the concepts is required for advancement to the next level of instruction.

The second form of feedback is almost exactly the opposite of the first. Here, the students are asked to rate the school. Specifically, they are asked to critique their individual programs. Gathering this sort of feedback is an attempt to extract information on how well the program is meeting the needs of the customers. Typically, questions regarding the level of difficulty of the material, the amount of time spent in preparing for the class, the effectiveness of the instructor at presenting the

information, the appropriate position of the individual course in the overall curriculum, and certain other aspects of the university experience are solicited on a periodic basis.

The third, type of feedback is provided by the employers of the school's graduates. Here, the school attempts to gauge how well it is meeting the needs of the community which ultimately hires the school's graduates. This type of feedback is perhaps the most difficult to obtain. It is complicated because the school must exert more energy- specifically, more time and money- in researching employer satisfaction. Simply figuring out who are the major employers of the institution's students is often a challenging endeavor.

Finally, the true test of this feedback comes from examining how the school reacts to this information. Schools are often criticized for allowing students to advance through the programs without having fully mastered the concepts presented to them. Some examples of this include lowered standards for collegiate athletes and the tendency of instructors to avoid conflict by advancing all, or almost all, of their students. This sort of behavior often results in a general weakening of the degree and a watering down of the quality of the school's graduates.

How well the school reacts to criticism from its own students is also very important. This criticism provides a window into how important the views of its students are to the institution. If this feedback is consistently ignored and never results in change, students will soon lose interest in providing this valuable information to the school. On the other hand, when the school listens and reacts to the feedback and demonstrates empathy by revising, eliminating, or adjusting classes, the students feel valued and empowered by the changes.

Finally, listening to the employers and adjusting curriculum to meet the needs of these customers is crucial. Some believe the success of a school is measured by the ease with which its graduates are hired. If the school is inattentive to the needs and desires of employers, the payoff is often fewer new hires or greater training costs to bring the graduates up to speed with the industry in which they are hired. However, if the school is attentive and works with the business community to create successful programs, the results are often beneficial to the school, the students, and the employers.

To determine which feedback methods have been most effective in enabling students to comprehend and apply total quality principles, the interview respondents were asked several questions concerning the different feedback

techniques employed by their institutions. The following

section presents a discussion of some of the results of

these questions.

Do you attempt to obtain feedback from the students?

Each of these schools has attempted to obtain feedback from

its students in some form or another. The methods of

obtaining the feedback varied from informal in-class

discussions to elaborate computerized systems statistically

analyzed for trends. Interview results indicated that the

military institutions have placed a greater emphasis on

student feedback than have their civilian counterparts.

This is best exemplified by Air University's Air War College

and Air Command and Staff College.

At the Air War College, a comprehensive feedback system

exists. Feedback is solicited from students for practically

every aspect of student life. All courses are critiqued,

and the results are forwarded to a separate evaluation

section. This independent body reviews all critique

rankings (done on a Likert-type scale) and narratives and

then identifies weak points and areas which need immediate

revision or attention (Ashley).

Similarly, at Air Command and Staff College, feedback

is obtained from the students on a daily basis. Each

student is issued a 486 notebook computer on which all of

the day's assignments are downloaded. After the students

complete the assignments, 3 of the 14 seminar students are

asked to critique the lessons on presentation,

comprehensibility and clarity, involvement of technology,

pedagogical approach, and level of difficulty. Furthermore,

there is an end-of-course critique given to all students

upon completion of the program. Finally, all critiques are

forwarded to a neutral third party for review (Johnson).

The technological theme continues at the United States

Naval Academy. While no longer teaching quality, feedback

for other courses is solicited at the end of both the

lecture week and the semester. Approximately one third of

the students is randomly chosen to provide feedback

electronically on level of difficulty, amount of time spent

on preparing for class, and quality of instruction.

The Air Force Quality Institute offers a slightly

different approach. Feedback here is obtained from the

students through the use of an "Alpha-Beta" test. The Alpha

portion is given when the course is initially offered. A

group of subject matter experts and various academicians is

invited to review the course and give comments and

suggestions on how the material and presentation are

interpreted. The Beta portion is given to a target group of

students. Comments and suggestions are obtained from the

students in much the same way as from the Alpha group. The

AFQI also obtains interim feedback in an informal manner by asking students to rate the course at the end of each lecture by using a plus and minus system. This system helps the instructor obtain real-time data identifying the strong and weak points in the classroom (Thomas).

At the United States Air Force Academy, feedback is solicited from students through mid-course and end-of-course critiques. The difference at this school is that the feedback results in immediate changes in the course. The school is very concerned that the student's needs are being met and that it appears responsive to the student body. Lieutenant Colonel Lowe admitted that this rapid response to feedback sometimes causes problems because the faculty can be in an ever present state of change (Lowe).

As stated earlier in this section, the civilian schools all have feedback systems which differ from those of their military counterparts. Noticeable differences are evident in how the schools react to the feedback. For instance, at Kansas Newman College, student feedback is a major factor considered for promotion, tenure, and retention (Stanley). At the University of Michigan, student feedback is analyzed and then placed in the school library. A database is created to provide students a living collection of previous student impressions of the courses. The school feels this can assist students in making informed decisions about which

courses to take and with whom they want to take them.
Michigan also contacts graduates two years after graduation
and asks them to complete a comprehensive questionnaire
designed to gather information on how well the school
prepared them for future employment (Kurta).

When the University of Texas reviews its feedback
critiques, if it becomes apparent that students are
dissatisfied with the course, the school will offer them
either a chance to retake the course or refund their tuition
(Dunn).

Dr. Alan Bailey discussed some challenges he has faced
when dealing with student feedback. The collective
bargaining agreement between the school and the faculty
union restricts the authority of the school administration
and ultimately the school evaluation system. Any
discussions about substandard faculty performance must be
handled with great care and even then only between the
supervisor and the employee. Dean Bailey feels this creates
potential problems because any time restrictions are placed
on the feedback system, the impact on change is narrowed
(Bailey).

**Which specific methods do you use to measure how well
the students are comprehending and applying quality
principles within their fields of study?** Responses to this

question were overwhelmingly similar. All but one of these schools have placed a great emphasis on written examinations. Term papers, talking papers and oral examinations have also been used extensively at the schools. The only noticeable exception to this is the University of Miami. Dr. Gitlow described how his program has been attempting to eliminate letter grades. He assumes that anyone who gains admittance to the school has the ability to graduate, but it may take some longer than others. Instead of assigning letter grades, students simply remain in the course until they demonstrate a command of the material, or until the professor feels they have reached a level of mastery. After this, they graduate to the next level of instruction. Therefore, everyone at the University of Miami graduates with a 4.0 GPA (Gitlow).

Do you attempt to obtain feedback from the employers of your graduates? There appeared to be a general lack of formal employer feedback gathered by the respondents. Although many schools are attempting to initiate employer feedback programs, little data was available to answer this question. However, some exceptions are discussed below.

At Cornell University, feedback is gathered from employers when they come to recruit. Meetings are scheduled to assess what the employers are looking for in their new

employees. Furthermore, when Cornell plans changes, it approaches employers first and asks them what changes they would like to see (Thomas).

Industry advisory groups are used at Kansas State University and Iowa State University. These groups assess industry needs and provide advice on how the school's programs should evolve.

Due to the fact that the programs at the University of Miami involve fully employed students, promotions and pay increases provide insight into how well the school is preparing its students (Gitlow interview).

At Air Command and Staff College, feedback is obtained from the students commanders one year after graduation. Surveys are sent asking the commanders if the curriculum was effective, and if they are receiving better strategic thinkers, critical thinkers, and leaders who are willing to question and "think outside the box." Although there are no long term surveys sent to the commanders, there are plans to accomplish similar feedback methods at the three- and five-year points (Johnson).

Finally, Colonel Ashley of Air War College admits that obtaining feedback on leadership changes is difficult. Many of these changes are intangible simply because of the nature of military employment. Nevertheless, 18 months after graduation, a questionnaire is sent to supervisors asking

them what changes are visible in the AWC graduate. The
questionnaire also provides the supervisor information on
the focus of Air War College (Ashley).

General Issues

Questions concerning the strengths and deficiencies of
these educational processes were asked of the survey
respondents. The questions were designed to elicit
information on the institution's successes, disappointments,
and roadblocks encountered in implementing total quality
education. The respondents were also asked to comment on
any improvements they would like to make to improve their
programs. The following section discusses some of the
results of these questions.

What is your greatest success? There were three main
answers given regarding the greatest success with efforts to
enable students to comprehend and apply total quality
principles.

Ability to apply in real world. Kansas Newman has seen
their students apply what they are being taught by having
the students visit local organizations and work with them
directly on a problem. This better enables the students to
understand the details of what they are being taught
(Stanley). The graduates from San Diego State University

are able to "hit the ground running" and are not intimidated by the challenges surrounding quality concepts (Bailey). Even at Kansas State University, where the teaching of quality principles is still relatively new, the students are provided with a strong foundation to take with them to their jobs (Hightower).

Seeing the big picture. Several universities stated that the ability to have the students step back and see the whole picture, instead of focusing strictly on the details, is very important (Lowe). Colonel Ashley elaborated on this point by explaining that the Air War College has brought common sense back into the classroom. Without understanding the concepts and ideas that total quality principles are based upon, the details and jargon are meaningless.

Large audience. Many respondents cited the ability to reach a large audience as one of their universities greatest successes. The University of Texas has been able to educate the community and to gain widespread comprehension of quality principles (Dunn). The Air Force Quality Institute measures their success by the increase they have seen in the demand for the course.

What is your greatest disappointment/roadblock? The respondents gave four main answers in regard to their

greatest disappointment or roadblock with efforts to enable
students to comprehend and apply total quality principles.

Lack of internal quality. The chief roadblock reported
by several universities was the lack of leadership in
quality initiatives. A major frustration at Air War College
is that the administrative sections do not do a good job of
promoting quality within their organization. It is
difficult to lead others when you cannot effectively lead
yourself (Ashley). The same is true at San Diego State
University, where the university does not necessarily
practice quality in its own environment. The students see
the university teaching quality, but they do not see the
university role modeling quality (Bailey).

Negativity of quality. Because of the over-emphasis on
integrating quality combined with lack of emphasis in
support and training programs, the term "quality" has gained
a negative connotation. One of Air Command and Staff
College's greatest challenges is overcoming the negativity
and misunderstanding often associated with quality. The Air
Force (along with many other organizations) may have
attempted to do too much too fast and, in the process, may
have alienated some personnel (Johnson). The University of
Texas has seen the breaking down of people's paradigms about
quality and the quality movement as one of their greatest
challenges (Dunn).

Reluctant faculty. One of the major difficulties that several of the universities noted was the reluctance of faculty members to teach material associated with quality. Kansas State University has seen an unwillingness in their faculty to give up the time and credit hours for information and skills that they believe should be learned on the job (Hightower). The goal of the faculty and administration at the University of Michigan is to keep things as they have been in the past. There is a strong resistance to change and new ways of thinking (Kurta). The dean of the San Diego State University believes that the faculty outside the core courses are simply unaware of quality. He would like to see a broader faculty understanding and integration of quality across the university (Bailey).

Later use. A frustration that several of the universities have encountered is the lack of use of this quality education on the job. Hearing complaints from previous students that nothing is happening or being allowed to happen on their job sites is a great disappointment for the faculty of any university. The students are filled with great ideas and are unable to get anything implemented in their organizations (Stanley and Hightower).

Have you encountered any ineffective or impractical processes? The activity that has been seen by these schools

as the most ineffective process is teaching directly from the book. Ms. Stanley noted that "the students want to get their hands dirty and learn the information in an applicable manner." If you have faculty who want to teach strictly from the book and have no real-world experience tied into the class, the students will get frustrated, and the learning is ineffective. Mr. Hightower believes that, although the ideas and principles behind quality need to be brought to the students, some of the processes are extremely time consuming and provide little return. There needs to be a method to eliminate teaching those processes that are not as beneficial to the students' long term gain.

What future improvements would you like to make?
Respondents gave two main answers indicating their greatest disappointment or roadblock with efforts to enable students to comprehend and apply total quality principles.

Reach more people. Most of the universities were extremely proud of the programs that they had developed to teach their students quality principles. The next step that many of these universities would like to see improved is the ability to reach more people. They would like to increase interest about the topic of total quality and to expand the assets to provide the educational opportunity to a greater number of students (Thomas, Dunn, and Gitlow).

Integrate. The most commonly theme regarding future improvements is that of integration of the quality concepts into all academic areas. Quality management should become an integral part of the whole curriculum, rather than an isolated tool. It needs to become a fundamental way in which people think about their work (Bailey). Total quality efforts should become so integrated into the separate disciplines that there would no longer have to be a single course dedicated to TQM (Kurta). Having a TQM degree next door to a general business degree is not the most productive manner in which to teach the subject (Stanley).

Summary

The educational processes of curriculum development, course construction and delivery, and gathering of student feedback were examined at various institutions. Strengths and weaknesses as observed by these institutions were also examined. The innovations and techniques in these processes, which were highlighted in these interviews, are examples of the efforts developed by various civilian and military universities to enable their students to comprehend and apply total quality principles. The compilation of the processes summarized in these findings should facilitate the efforts of DoD institutions seeking to adopt similar total quality education programs.

V. Conclusion

Summary and Analysis of Findings

The educational environment is a vibrant, continuously evolving entity. It is constrained only by the innovation and energy placed into it by its contributors. The enormity of the higher education system in the United States and its virtually limitless boundaries is quite impressive to say the least. In our very limited examination of this segment of our society, we have come away with an overwhelming appreciation for the commitment and motivation evidenced by the multitude of players who take part in its daily evolution. Any research attempting to draw conclusions about it runs the risk of merely scratching the surface. Inspired by the original thesis, we intended to continue to explore benchmark programs found in today's universities. By expanding on themes similar to those used in the 1993 research, we hoped to be able to provide insight into a small part of the evolution of quality in academia.

Although this chapter is entitled "Conclusion," we find it difficult to make sweeping judgments or pronouncements about our research. The educational community, by its very nature, is constantly changing. It is one way today and an entirely different way tomorrow. What works best at one school would be wholly inappropriate at another, just as

what works best for one student may be entirely wrong for
someone else. How then are we to assess what we've found?
We have come to the conclusion that by comparing and
contrasting trends discovered in the first thesis with those
found in ours, we can paint a picture, albeit a capsulized
one, of the state of quality in academia. The following
sections discuss this analysis.

Curriculum Development

   While most schools continue to offer formal classes in
quality improvement, it is apparent that current programs
focused less on lecturing on quality principles and more on
integrating them into the entire educational environment.
It appears that schools expect their students to have a
greater initial understanding of quality principles and view
their role as facilitating the honing of those skills. It
is apparent that military educational institutions are
moving away from traditional classroom instruction of
quality. This is generally the case because the majority of
military members have already received quality training, and
now only those selected for advanced schools receive
"executive" quality instruction.

   Most institutions were unable to provide guidance for
curriculum construction and content. This finding is
consistent with that of the previous research. The military

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institutions continue to rely more heavily on formal
guidance, whereas the civilian schools tend to rely on
informal departmental or individual strategies. As is
consistent with the original thesis, one curriculum
development process found in virtually all the institutions
is a departure from traditional teaching methods and relies
on formal classroom lecture. More classes are taught using
real-life scenarios, team techniques, and partnerships with
industry.

The interview respondents cited change as the one
factor which was inevitable in all of their programs. This
theme is evident in virtually all of the institutions. For
the civilian schools, change is often demonstrated by the
school's ability to react to the changing needs and desires
of their customers. As students become more aware of
quality concepts, their expectations change. The schools
are forced to be flexible and to react to their changing
clientele. These programs are forced to stay on the
"cutting edge" in providing this education. It is self-
evident for many schools that if they are not providing the
best quality curriculum, certainly others must be. It
becomes more a matter of survival for the civilian schools.
Attracting the student and the education dollar that he or
she brings is an important part of how the program is
managed. On the contrary, military institutions are less

burdened with attracting students. Tuition at these schools is not exchanged as it is in the civilian community, and there is little competition for students. Many of these schools face their competition in military drawdowns and cutbacks. Obtaining funding and justifying their existence tends to be a theme at many military schools. At military institutions, because the battlefields are in areas of budget and program existence, school administrators can become less attentive to the needs of the student customer. Their reaction time is decreased, and a certain lethargy and status quo mentality can become prevalent.

With the exception of the adult education/seminar programs, students played little, if any, role in influencing curriculum development. This finding is consistent with past research; however, as students become more aware of what they want and need from their education, they will continue to exert pressure on academia to meet those needs.

Course Development and Delivery

Many institutions continued to invite outside speakers to address the student body. While guest lecturers often came from academia themselves, many more were leaders in industry and future employers. It appears that schools are well aware that their program's success is often judged by

its ability to get its students jobs. Cooperation with the business community and partnerships with industry have become more prevalent. Corporations are more willing to enter into cooperative agreements with schools and are more enthusiastic about sponsoring programs. The business world seems to realize that in order for academia to provide competent, enlightened students, it must play a part in their development, as well.

Team-teaching techniques appear to have declined. As the programs become more refined and focused, there is less of a need to cross disciplines or departments. Most programs already employ the necessary faculty and staff. Employing two instructors where one is sufficient can become costly, and the payoffs tend to be limited. Group discussion techniques, student team exercises, and real-life scenarios are all very active parts of many programs. Traditional lectures and an environment in which students simply sit back and take notes is going away. These techniques may work well in entry level courses, but as the material becomes more focused, student participation becomes more active, and their ability to contribute to the lesson increases. This is especially so when the students can bring real-world experiences to the classroom. Civilian schools are focusing more on problems faced in the business community, while DoD institutions are focusing on the

abundant leadership aspects of real-life events. Furthermore, when students work together in teams, the learning process tends to improve. Students learn not only from the material presented by the instructor, but also from their teammates. Additionally, students tend to become more involved when they participate as team members. They develop a vested interest in the team's success and tend to produce more for the group than they would for individual efforts.

Many institutions continue to make efforts to integrate quality improvement instruction within other courses and departments throughout the curriculum. Integrating quality into all aspects of university life continues to be a challenge, but remains a goal at most schools. It becomes self-validating for universities when students see them practicing what they preach and role modeling the concepts they instruct.

Feedback

Obtaining feedback which measures how well the students are actually comprehending and applying total quality principles remains a challenge at most universities. While the continued use of traditional testing methods remains standard at most institutions, some schools have begun institutionalizing non-standard testing practices, such as

evaluation of group projects, participation in real-life scenarios, and even assignment of non-letter grade assessments of student performance. It is difficult to determine the effectiveness of such techniques, as many of these testing methods are exploratory in nature or simply part of the larger testing scheme.

The trend to obtain more feedback from the students about the overall curriculum or course content continues. Perhaps more importantly, schools appear to be listening to the students' perceptions and concerns. Elaborate systems for gaining student feedback exist and are sometimes evaluated by independent third parties who have the authority to influence the curriculum. This sort of feedback is especially prevalent at Department of Defense institutions.

The process of obtaining feedback from current or prospective employers continues to vary substantially from institution to institution. It appears the schools are becoming more aware of the impact this feedback can have and are actively pursuing policies which can capture this information. However, written surveys, recruitment practices, and informal discussions tend to be the most common methods used to gain this information.

Strengths and Deficiencies

The schools in this study noted a variety of strengths and deficiencies in their programs. Many schools continue to observe an increased acceptance of quality practices in and out of the classroom. Old paradigms seem to be disappearing and making room for new practices to take root. The use of quality principles is migrating out of the management department and is becoming more prevalent in other classes and university functions. Even though the process appears to be slow, increasingly more faculty and administrators are accepting quality initiatives into their daily routines. Furthermore, improved employer satisfaction and involvement in the community beyond the campus continues to increase. Businesses that have long embraced many quality policies are now finding more willing allies on college campuses.

Although the successes are many, roadblocks continue to exist. Some schools are simply not able to overcome traditional hurdles, such as lack of infrastructure support and dwindling resource allotments. They are further stymied by antiquated systems of internal management and the shortsightedness on the part of some of the leadership. Also, as discussed earlier, the act of "preaching" quality in the classroom and practicing something else outside

continued to be a practice which was impractical and
ineffective.

Finally, several respondents hoped the future of
quality instruction would evolve into one that included more
people from various backgrounds. Pioneering alternative
learning programs, such as distance learning, is one method
of communicating the message to a larger audience. Also,
internships and programs which involve cooperative efforts
with industry are being sought by many of these
institutions.

Practical Implications for the DoD

Many of the processes discovered by our interviews
continue to be highly appropriate for use by Department of
Defense educational institutions. In fact, several DoD
institutions continue to be the leaders in implementing
educational processes designed to teach students how to
comprehend and apply total quality principles.

DoD educational institutions continue to have some
distinct advantages over their civilian counterparts. For
example, they tend to have a captive audience. The employer
of a DoD student is always the DoD. Therefore, educational
policies tend to be directly responsive to the needs of the
military. Furthermore, policy changes and the general
evolution of quality curriculum are more easily adapted to

in the military environment. The chain of command already exists and, however inefficient the lines of communication maybe, there is no denying that an elaborate system for directing this educational commodity is already well established.

Our predecessors cited the fact that since, the DoD is limited by law concerning the use of resources, curriculum content, and manpower, they are at a disadvantage in comparison to its civilian counterparts (Bond and Shimel, 1993:100). We do not agree with this assessment. While it is true that many different rules of engagement exist for the military, still many others do not.

We feel it is important to note that we recognize that the academic environment in the United States is continuously evolving. We do not claim that the processes discussed in this research are complete and indisputable. New processes are constantly being tried, and old ones are constantly being eliminated. It is merely our intent to provide DoD institutions seeking to improve their capability to provide students with the ability to comprehend and apply total quality principles, with a better roadmap for that implementation.

Recommendations for Further Research

Future research may involve an in-depth case study of one institution which has, "cracked the code" on infusing quality principles into its curriculum. Also, further research may include an exploration which assesses the organization's use of Baldridge Criteria for Educational Institutions. Another possibility may involve a study in five years which examines how the thirteen universities in this study have progressed in that time. Finally, a study into the use of benchmarking in academia may be attempted. How do the leading institutions share their successes and with whom is this information shared?

APPENDIX A
DEMING'S 14 POINT MANAGEMENT PHILOSOPHY

Appendix A

Deming's 14 Point Management Philosophy:

1. Create a constancy of purpose for the improvement of product and service.

2. Adopt a new philosophy.

3. Cease dependence on mass inspection.

4. End the practice of awarding business on price tag alone.

5. Improve constantly and forever the system of production and service.

6. Institute training and retraining.

7. Institute leadership.

8. Drive out fear.

9. Break down barriers between staff areas.

10. Eliminate slogans, exhortations, and targets for the workforce.

11. Eliminate numerical quotas.

12. Remove barriers to pride in workmanship.

13. Institute a vigorous program of education and retraining.

14. Take action to accomplish the transformation.

APPENDIX B
TELEPHONE SURVEY QUESTIONNAIRE

TELEPHONE SURVEY QUESTIONNAIRE

NAME:_____

SCHOOL:_____

POSITION:_____

PHONE:_____ OFFICE HOURS:_____

INTERVIEWER INTRODUCTION: The purpose of this survey is to collect data on education programs emphasizing Total Quality Management principles initiated by various university level institutions. The data will be used to determine common strengths and weaknesses associated with providing students with the ability to comprehend and apply quality principles within their fields of study.

Although we have attempted to write the questions so that they can be answered directly and briefly, please feel free to add any comments you think might benefit other institutions attempting to implement total quality education programs. This interview is designed to last approximately 30-45 minutes.

PERMISSION TO TAPE INTERVIEW: In order to facilitate data collection, I would like to tape this conversation. Is it all right with you if this interview is taped?

This survey is divided into four major sections:
    1. Overall curriculum development.
    2. Individual course development and delivery.
    3. Feedback methods.
    4. General wrap-up questions.

Section 1
Overall Curriculum Development
(Please remember, questions about *individual course* development and delivery will be asked later, in section 2)

1. Does your school offer a major in Quality Management? If so, what is the curriculum?

2. Does your school offer a formal class (or classes) specifically dealing with Quality Improvement concepts such as TQM, Continuous Improvement, Organizational Learning, etc.?

    a. Is it a mandatory/core course?

    b. Does it focus on a particular advocate or approach (e.g. Deming, Crosby, TQM, Continuous Improvement)?

3. Does your institution have any formal or informal guidance for curriculum construction and content?

    a. Does this guidance contain specific consideration for teaching students how to comprehend or apply total quality principles? (If so, what are the highlights?)

    b. If yes to "a" above, may we have a copy of that guidance?

4. What changes have you (either personally or institutionally) made to the general curriculum structure to teach students how to apply total quality principles?

5. Which specific departments or disciplines have most actively adopted quality education initiatives? What are the results?

6. What guidelines do you have, if any, to teach across disciplines or offer multi-disciplinary courses?

7. To what degree do students participate in general curriculum or program development? (*Please remember, questions about specific courses will be asked later*)

Section 2
Individual Course Development and Delivery

9.   What changes have you (either personally or institutionally) made to any particular course or courses to teach students quality principles, applications or concepts?

10. Have you (either personally or institutionally) used any one or a combination of the following methods to teach students total quality principles? (Feel free to comment):

_____Do you invite outside employers (For example, business leaders, CEO's) to talk to the students?

_____Do you use team teaching (which we define here as: sharing teaching duties with another instructor from the same department)?

_____Do you invite instructors from other disciplines or departments to teach?

_____Do you employ group discussion techniques?

_____Do you use student team exercises?

_____Do you use real life scenarios?

_____Do you integrate and teach quality improvement methods from this course within other courses? (Examples of quality improvement methods include: real life problem solving techniques, benchmarking, teamwork building techniques, statistical process control, etc.)

_____Other? Please specify.

11. Which courses reflect the most active implementation of quality education initiatives? Why? What are the results?

12. To what degree do students participate in course development?

Section 3
Feedback Methods

13. Do you attempt to obtain feedback from the students?

    a. How?

    b. In what specific areas do you or your institution solicit student feedback? (*check the ones that apply*)

        _____a specific instructor
        _____a specific course
        _____the entire curriculum
        _____the university educational environment
        _____other (please specify)

    c. When and how often is student feedback solicited?

    d. Who sees the student feedback?

    e. How does the student feedback result in change to the curriculum?

    f. How does the student feedback result in change to individual courses?

    g. Does the student see the result of the feedback? How?

14. Which specific methods do you use to measure how well the students are comprehending and applying quality principles within their fields of study? What are these measures?

15. Do you attempt to obtain feedback from the employers of your graduates?

    a. How do you obtain feedback from employers?

    b. When and how often is employer feedback solicited?

    c. Who sees the employer feedback?

    d. How does the employer feedback result in change to the curriculum?

    e. How does the employer feedback result in change to individual courses?

16. Since the implementation of the quality management curriculum/courses, have you noticed any changes in employer satisfaction with your university? With your students?

Section 4
General Wrap-up

17. What is your greatest success with your efforts to enable students to comprehend and apply total quality principles in their fields of study?

8. What is your greatest disappointment with your efforts to enable students to comprehend and apply total quality principles?

19. What roadblocks have you encountered in your efforts to enable students to comprehend and apply total quality principles?

20. Are there any processes that you found in your efforts to enable students to comprehend or apply total quality principles which were ineffective? Impractical?

21. What further improvements would you like to make to enable students to comprehend and apply total quality principles in their fields of study?

22. Are there any questions which you feel I should have asked you, but failed to do so?

23. Do you know of anyone else who would be a good candidate to interview?

NAME:_____

SCHOOL:_____

POSITION:_____

PHONE:_____ OFFICE HOURS:_____

NOTE OF APPRECIATION: Your effort in completing this survey is greatly appreciated. If you would like, we would be happy to send you a copy of the results of this research once it is completed. If you would like to add any comments later on, please feel free to contact me or my research partner by any of the methods listed below. Thank you for your time.

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APPENDIX C
TELEPHONE INTERVIEW SUMMARIES

The following appendix contains interview summaries by the
individual respondents. The surveys are listed
alphabetically by institution.

TELEPHONE SURVEY SUMMARY

NAME: Colonel Chuck Ashley

SCHOOL: Air University: Air War College

POSITION: Chief, Department of Leadership and Ethics

PHONE: (334) 953-7657   DSN: 493-7657

DATE: 8 May 96   TIME: 1000-1130

INTERVIEWER: Koizen

CURRICULUM DEVELOPMENT

Air University's Air War College is designed for the
executive leader whose tasks are strategic level application
and analysis. This senior service school runs for ten and a
half months and is divided into four equal quarters. There
are approximately 250 students enrolled in any given class,
which typically includes Air Force Lieutenant Colonels,
Colonels and above, and their equivalent Army, Navy, Marine,
civilian and foreign military counterparts. The curriculum
is broken down into five distinct departments, which include
Conflict and Change, Leadership and Ethics, International
Security Studies, Strategy Doctrine and Airpower, and Joint
Warfare Employment. There are no degrees awarded from the
school; as such, there are no majors the students must
select. There is, however, a core curriculum which includes
areas of emphasis highlighting many quality principles.

Quality leadership is taught within the Leadership and
Ethics (L&E) department. The typical L&E curriculum
consists of 41 classroom hours with 10 hours devoted to
quality education. The remaining 31 hours are divided into
ethics, command responsibilities, and other executive
development education. Quality instruction at the senior
officer level is centered on leadership examples and
development of leadership tools. Specific emphasis is
placed on development of the executive leader's talents and
tools through extensive focus on core values application,
strategic planning, and benchmarking.

Additionally, there are over 100 electives offered at the
school, and each student selects six or seven of them.
Typically, two electives are taken each quarter, and 15-20%
of the students take Principle Centered Leadership. Thus,

in this advanced study program, students have the
opportunity to place an emphasis on many quality areas,
especially leadership.

Colonel Ashley discussed how this emphasis on quality has
evolved over the past several years at AWC. Four years ago,
students arrived at the school lacking basic quality skills
and competencies. To compensate for the general lack of
quality awareness, many hours were devoted to teaching
quality techniques, the origin of quality, and the history
of quality in AWC curriculum. In the past four years, much
improvement has been made across the Air Force in quality
training its personnel. Because of that, students now
arrive with the basic competencies, and AWC has evolved away
from quality training and toward promoting quality
education.

The objective of AWC is to develop senior leaders who have
the skills to be critical thinkers. Courses are presented
using a macro approach with the intent of demonstrating what
the "big picture" is in the Air Force. Much of what AWC
does is centered around the strategic planning process and
the Air Force's Strategic Planning Model.

Although there is no one particular advocate or approach
that AWC focuses on, Dr. Steven Covey's Seven Habits of
Highly Effective People is important to the curriculum.

Formal guidance for curriculum construction and content is
detailed in the Instructional Systems Development (ISD)
Model. This model includes five phases for development of
curriculum and applications for their respective management
aspects. The five phases are Analysis, Design, Development,
Implementation, and Evaluation. The model is detailed in
Air Force Manual (AFM) 36-22-36, Guidebook for Air Force
Instructors, and AFM 36-22-34, a 14 point instructor's
handbook. These guides provide information for curriculum
construction in any area, not just in quality.

Before curriculum is established for the following school
year, guidance is solicited from the commandant. Although
this guidance is not formal, it does address issues gathered
both in discussions with external customers and from higher
command levels. Real-world case studies focusing on
Command, Responsibility, Accountability, and Discipline
(CRAD) are a result of this informal feedback.

Major changes in the school's quality curriculum revolve
around the fact that students now arrive with basic
knowledge and understanding of quality. Fewer hours are

spent teaching quality, but more time is spent promoting the positive use of quality. The focus is on the Strategic Planning Model. The students are taught to be open to new ideas. The resultant senior leaders should demonstrate positive attitudes toward areas in which they were once skeptics.

Although the promotion of quality is present in all five departments, the Leadership and Ethics department is the dominant player in introducing quality in the classroom. The Leadership and Ethics agenda is taught across the curriculum and is present in the curricula of all five departments. Conversely, the other departments have a specific amount of time when they are in charge of the classroom.

In the past, students have participated in Process Action Teams with the intent of determining what role quality will have in the classroom. As stated earlier, the current curriculum contains fewer hours of quality education than it has in the past. Students can influence the program through the use of the school's "Valentine" system. This is an informal way of communicating directly with the Dean. Responses to Valentines are typically returned to students within 24 hours.

COURSE DEVELOPMENT AND DELIVERY

Military and business leaders, CEOs, and various quality experts frequently speak to the student body. Over 70% of lesson delivery is presented in seminar format. Brainstorming and Nominal Group Technique are used in many exercises. The school is working toward obtaining the technology to allow electronic brainstorming. This will eliminate bias and other influencing factors when brainstorming techniques are utilized.

Student Team exercises play a large part in the learning process. This is especially true in the Joint Warfare Employment area. Simulations of real-world events and role playing dominate this section.

The quality message is most frequently delivered by the Leadership and Ethics department. Course work reflecting this is evident in Strategic Planning, Benchmarking, Organizational Assessment, and Perpetuation of Quality in the Senior Leader electives.

FEEDBACK METHODS

A comprehensive feedback system exists. Feedback is solicited for practically every aspect of student life. All courses are critiqued and funneled through a separate Evaluation Section. This independent body reviews all critique rankings and narratives and identifies weak points and areas which need revision. Although this feedback is anonymous, the school places a lot of emphasis on getting a high rate of return on the critiques.

All course work at the AWC is graded either through examinations or written papers. The papers provide an opportunity for students to comment on their thoughts about their own strengths, weaknesses, and abilities as leaders.

Obtaining feedback on leadership changes in graduates is difficult. Many of these changes are intangible simply because of the nature of military employment. Nevertheless, 18 months after graduation, a questionnaire is sent to supervisors asking them what changes are visible in the AWC graduate. The questionnaire also provides the supervisor with information on focus of the training at AWC. Colonel Ashley commented on how the quality courses are some of the least well received. Quality is not an easy or popular subject to teach. Many students arrive frustrated with the state of quality in the field. Overcoming these frustrations is a key element of instruction at the AWC. Students are encouraged to "vent" their frustrations at the school, so that when they leave and are in a leadership position, they do not send the wrong message to the troops.

GENERAL ISSUES

According to Colonel Ashley, his greatest success is learning how to listen to the student and apply common sense to classroom interaction. He comments on the openness to quality the current AWC administration has and attributes that to the growing process and general culture change evident across the Air Force.

A frustration for him is that the AWC is not further along in quality on its own. He cites Dr. Steven Covey by saying, "to effectively lead others, you must effectively lead yourself." The AWC does not do a good job in leading by example in promotion of quality. A footnote on all of this is the positive influence gained from AWC's residence next to the Air Force Quality Institute (AFQI). Furthermore, it

is often the case that instructors are heavily tasked with not only course work, but also additional military duties. By its very nature, the quality world is continuously evolving. When these instructors are so tasked that they are unable to keep up with these changes, it detracts from their ability to gain a true depth of knowledge. More time is needed for the faculty to "sharpen their own saws" in the material they're responsible for presenting to the class.

Colonel Ashley is anxious for more senior direction and leadership on where quality should go in the Air Force. He acknowledges that the Air Force is at a crossroads, but many people are waiting for some executive leadership to guide them along the quality path.

TELEPHONE SURVEY SUMMARY

NAME: Dean Alan R. Bailey

SCHOOL: San Diego State University

POSITION: Dean, School of Business Administration

PHONE: (619) 594-5259

DATE: 1 July 1996   TIME: 1200-1230

INTERVIEWER: Koizen

CURRICULUM DEVELOPMENT

The San Diego State University (SDSU) has approximately 30,000 students. Of this population, approximately 5,000 are undergraduate business majors and 900 graduate students. As part of the California state university system, the SDSU's mission is defined by state educational codes which mandate only the upper one third of California high school graduates admission to the university. The school offers Bachelor of Science degrees in 12 areas and Master of Science degrees in 14 areas.

Although no majors in Quality Management are offered at the university, formal classes specifically dealing with Quality Improvement concepts are electives in the curriculum at both the graduate and undergraduate levels.

Theoretically speaking, courses do not focus on any particular advocate. Practically speaking, instructors tend to emphasize that which they are most familiar. Dean Bailey noted that some instructors are Deming disciples and feels that those concepts tend to be highlighted more than others. He emphasized that the courses are designed to talk about the quality movement in broad terms rather than specific.

The curriculum model at the university puts the main emphasis on the academic departments as the initial generator of curriculum proposals. All curriculum proposals at the university flow out of academic departments to the college level evaluation and eventually to the university level. All new courses begin and are sponsored at the department level.

The general curriculum of the university is guided by the mission of the college and the goals of the academic programs. This is demonstrated by the following four major signature themes; Quality Management, Entrepreneurship, Globalization/International Business, and Management of Technology. It is the goal of the business school to integrate these themes as much as possible in both the undergraduate and graduate programs.

The Management Department and the Information Decision Systems Department are the joint sponsors of curriculum development in quality management at the university.

Interdisciplinary work at the business school focuses on the common body of knowledge required by all business majors. The school tends to focus this work in the upper division business core.

Students do not participate in curriculum development.

COURSE DEVELOPMENT AND DELIVERY

The Production course has been broadened to an Operations Management course which is fundamentally based around the quality theme.

The school often invites outside employers to talk to the students. It also participates in group discussion techniques, student team exercises and real life scenarios. The programs are particularly active in using statistical tools and team building.

Courses which reflect the most active implementation of quality education initiatives are the advanced Operations Management courses and Interpersonal Team Building courses in the Management Department.

Students do not participate in course development.

FEEDBACK METHODS

Feedback is solicited from students through an end-of-course evaluation. The evaluation uses a Likert scale with 80% of the questions discussing the instructor and 20% discussing the course content. The feedback is reviewed by the Dean, department chairperson, and individual faculty. Trends on the evaluations may result in changes being made to individual courses but rarely to overall curriculum.

It appears the feedback system is something of a paper tiger at the school. It can be viewed that the collective bargaining agreement between the school and faculty union restricts the authority of the administration and weakens the evaluation system. Any discussions about substandard performance are only allowed between the immediate supervisor and the employee. Dean Bailey feels this creates a problem because anytime restrictions are placed on the feedback system the impact on change is narrowed.

Dean Bailey suggest a possible way to overcome some of these restrictions is by creating academic themes that everyone agrees to.

Every 2-3 years, surveys of the community are given at both the undergraduate and graduate level. The surveys ask what skills the employer feels the students must possess in order for them to be contributors to their fields of business. The community is also surveyed on how well the school is preparing students in those skills.

This feedback is reviewed by the program directors and may result in change to the signature themes discussed earlier. The school.attempts to demonstrate what it is they are attempting to accomplish in the program and what is the best way to present that information. Courses are examined to find out which ones make the most sense in presenting that information.

GENERAL ISSUES

From a feedback stand point, Dean Bailey feels his greatest success is that when his students enter the business community they are able to "hit the ground running" and are not intimidated by the challenges surrounding quality concepts.

His greatest challenge, from a student point of view, is that the university does not necessarily practice quality in their own environment. The student sees the university teach quality but they don't see the university role-modeling quality.

The greatest roadblock is developing broader faculty understanding and integration in quality across the university. Outside of the core courses, faculty awareness in quality is not where it should be.

Further improvements the dean hopes to see is that quality management becomes an integral part of the whole curriculum, rather than being viewed as an isolated tool. It needs to become a fundamental way people think about their work.

TELEPHONE SURVEY SUMMARY

NAME: Susan Dunn

SCHOOL: University of Texas at Austin

POSITION: Senior Administrative Associate, Quality Center

PHONE: (512) 471-9970

DATE: 2 July 1996   TIME: 1000-1100

INTERVIEWER: Koizen

CURRICULUM DEVELOPMENT

The University of Texas Quality Center (UTQC) was created in May 1992 to provide affordable and excellent training in Total Quality Management for educational, government, non-profit and business organizations in the community surrounding the UT campus. It is a continuing education function offering training through seminars. It is separate from the UT Business School and the College of Engineering whose curriculum is separate and for credit. The UTQC has two offerings. The first offering is the Community Series which trains approximately 300-500 (1000-1500 per year) fully employed adults in half day, one day and 3 day seminars. The second offering is Custom Training offering specialized courses from 1-6 days in duration.

Although no major in quality is offered through the UTQC, students earn continuing education credits which results in a certificate of completion at the end of the course.

Some of the main courses in the core curriculum are TQM Fundamentals, Tools and Techniques, Problem Solving and Process Improvement, and Facilitating Quality Teams.

Courses taught through the UTQC are based on the Xerox quality training which emphasizes approaches advocated by Deming, Crosby, and Juran.

Courses have not changed much since their inception; however, the custom courses are designed to absorb changes necessary to tackle individual needs. For instance, customers will contact the UTQC with specific problems and ideas on how to make changes within their specific business. The school, through the use of a trainer, will deal with the

customer on a student level and will train them to help the business achieve the needed change.

Many departments on the UT campus have attended training from the UTQC. Some examples of departments which have actively adopted quality education initiatives are the university mail and supply operation, the administrative offices, the McDonald Observatory and the Mechanical Engineering Department.

Teaching across disciplines and offering multi-disciplinary courses does not apply to this program.

Students participate in general curriculum development through the use of strategic planning accomplished at the beginning of training. Students are given the opportunity to brainstorm what areas they feel need to be covered in more depth.

COURSE DEVELOPMENT AND DELIVERY

The center often invites distinguished speakers to lecture to the student body. Team teaching and instructors from other disciplines are not widely used. Group discussion techniques, as well as, student team exercises and real life scenarios are extensively used.

Because of the fact that the program is still in its early stages, changes to the original presentation methods have not been initiated. Ms. Dunn stressed the fact that the custom training courses are quite flexible and are able to react to the needs of their customers in a very unique and timely manner.

FEEDBACK METHODS

Feedback is solicited from the students informally throughout the program through verbalizing observations. The use of team and group presentation methods encourage the students to speak out. Furthermore, an end-of-course evaluation on the instructor and the session is accomplished by all students. This is a twelve question, Likert type, rating which is reviewed by the course instructor, the program director, and the conference coordinator.

Students can see the immediate results of their informal feedback if the course is altered while they are still in

session. Subsequent students may see the results of past
end of course evaluations.

Finally, if a student is so dissatisfied with the training
that the gave the program the lowest score on the
evaluation, the school will offer to refund the tuition or
allow them to retake the course at the school's expense.

The school attempts to obtain feedback from the customers
through informal surveys and word of mouth. The school
views repeat customers (from the same organizations) and
direct recommendations from past graduates as positive
feedback on their programs.

GENERAL ISSUES

Educating the community and gaining widespread comprehension
of quality principles is one the program's greatest
successes.

One of the school's greatest challenges is breaking down
people's paradigms about quality and the quality movement.

Ms. Dunn could not think of any significant roadblocks in
her efforts to enable students to comprehend and apply total
quality principles.

Ms. Dunn's future aspirations for the school's programs will
be its ability to reach the most people that it can. They
are exploring some distance learning techniques and hope to
implement them throughout the University of Texas extended
campus system.

TELEPHONE SURVEY SUMMARY

NAME: Dr. Howard Gitlow

SCHOOL: University of Miami, School of Business
Administration, College of Engineering, Institute
for the Study of Quality.

POSITION: Director/Faculty

PHONE: (305) 661-4425

DATE: 24 June 96   TIME: 1730-1800

INTERVIEWER: Koizen

CURRICULUM DEVELOPMENT

The University of Miami (UM) offers several different
options for obtaining degrees in quality management. The
first, a Master of Science degree in Quality Management, is
offered through the graduate school. The School of Business
Administration offers an MBA program which specializes in
quality management, and a Doctoral program with the same
emphasis.

The MS in Quality Management has twelve core courses in its
curriculum. They are: Principles in Quality Management,
Understanding the Theory of Variation (Statistics), Tools
and Methods for Improvement of Quality, Voice of Business
(teamwork, consensus building, conflict resolution), Design
and Experiments, Quality Issues of Business Accounting,
Course Sampling, Marketing Research Tools in Quality
Management, Voice of the Customer, Quality through Design,
Analysis of Quality Systems, and the capstone course,
Quality Management Practices. There is a thesis option.

The theoretical umbrella of the degree focuses on Deming,
while the administrative tools are Japanese.

Courses for the quality degrees use the Systematic
Instructional Design Model for curriculum construction and
content developed by the Motorola Corporation. This design
involves taking experts and practitioners in the field of
quality and grouping the areas through the use of affinity
diagrams to deciding what courses should be developed. The
resultant 12 courses are a direct product of this model.

COURSE DEVELOPMENT AND DELIVERY

The degrees have changed in the sense that they place a large amount of focus on real-world projects with close critique and tutelage from the instructors.

The twelve core courses fall under various departments. Those departments are: Management, Management Science, Marketing, Accounting, and Industrial Engineering.

Students within the degree play little to no role in curriculum development. Dr. Gitlow emphasized that they probably have no way of knowing what to contribute and feels this philosophy is in line with the thinking of Mr. Deming.

Outside employers are rarely invited to speak to the students. However, students visit companies which have institutionalized advanced quality concepts.

Team teaching is accomplished in the Marketing Research course by two professors in that same department. Group discussion techniques, student/team exercises, and real world scenarios are used throughout the degree. Professors bring an enormous amount of personal, real-world consulting experience to the classroom.

FEEDBACK METHODS

Feedback is solicited from students in both a formal and informal manner. Students evaluate the course at the end of the semester through a formal written evaluation. Questions on the quality of the instructor, course difficulty, curriculum, and university environment are asked. Students are also encouraged to informally provide feedback through verbalizing their comments. All feedback is analyzed for trends or patterns over time and any significant trends can result in course change. Feedback is reviewed by the chairman, individual faculty, the program director, and the Dean.

The school is working towards eliminating letter grades. It is the assumption that anyone who gets in the school has the ability to graduate, it just may take some longer than others. Instead of assigning letter grades, students simply remain in the course until the professor feels they have reached a level of mastery and graduate to the next level of instruction.

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Because all students in the quality programs are employed full-time, all classes are taught on the weekends. Feedback from employers is collected by assessing the promotions and pay increases students receive while enrolled in the programs.

GENERAL ISSUES

Dr. Gitlow describes his greatest success as that of establishing the program in the first place. The entire curriculum is standardized throughout and the use of electronic media is highly employed.

The greatest challenge is fitting a somewhat unconventional program into the overall university environment. Students in the quality program are on a different calendar, receiving financial aid is more difficult, and students tend to be older and more intimidated by entrance exams and removed from the educational mainstream.

One of the biggest roadblocks which the students face is the Graduate Record Examination (GRE). This is a difficult obstacle to overcome, especially for adult learner. Furthermore, Dr. Gitlow discusses how testing and administering grades is a bad practice and generally ineffective when it comes to assessing the student's level of knowledge and mastery. Finally, future improvements would include expanding the distance learning capabilities of the university and providing this education opportunity to a greater number of students.

NAME: Peter Hetland

SCHOOL: Iowa State University

POSITION: Quality Manager for Business and Finance School

PHONE: (515) 491-5098

DATE: 03 May 1996   TIME: 1000-1030

INTERVIEWER: Allen

CURRICULUM DEVELOPMENT

ISU does not offer a degree in Quality Management

There are relatively few courses that fall under the topic of total quality that are required by all the students. Recently, Mr. Hetland has seen a strong influx of students into these courses out of pure interest and quest for knowledge. The university is divided into eight separate functioning colleges, with four of these disciplines offering courses specifically designed at addressing the topic of quality management.

-The College of Engineering offers courses aimed at how quality plays a role along-side ideas such as manufacturing engineering, industrial engineering, and civil/construction engineering.

-The College of Business offers a graduate level TQM course, taken mostly by graduate and doctoral students. It is not a mandatory course for any student.

-The College of Education has a quality improvement course that is required for all the students in this school.

-The College of Liberal Arts and Sciences provides statistics for manufacturing and other organizational statistics type classes.

There is no formal or informal guidance that is provided for total quality curriculum construction and content. The institution does have guidance created for courses in general, but the detail of the instruction does not go into the specifics of TQM concepts.

Within the engineering curriculum, there has been an attempt to apply/add more quality into the early stages of the program. Within the Freshman and Sophomore years the

students are now getting a taste of the ideas and concepts that are seen in TQM. This change occurred mostly as a result of the schools partnership with Texas Instruments (details on this partnership are addressed later in the interview).

The quality efforts at the university started in the area of business and finance then slowly took hold in other operations and administration departments. Once the ideas and concepts began to take hold and the benefits could be seen, the slow transition into the educational departments began. The College of Engineering has taken a strong lead in the area of innovative methods for teaching quality concepts. The other three colleges that were previously addressed as containing quality in their curriculum have taken steps toward this direction, but are far behind the engineering school.

There are multi-disciplinary courses available to the students (especially at the graduate level). So, even though ISU does not offer a masters in quality, allowing students to choose courses across the departmental lines would allow a student to design their own degree in this area. There are several statistics, organizational behavior and other quality related courses that are open to any student that has the desire to enter the course.

The students at ISU do not participate in the curriculum or program development in a formal way.

COURSE DEVELOPMENT AND DELIVERY

There are numerous members on the faculty that are adapting their courses to better teach students the principles, applications, and concepts that are involved in quality. The next section better depicts the type of additions that have been integrated into many instructors classrooms.

There are many methods that ISU has used to teach their students total quality principles:
Outside employers are often invited into the classroom to present their real-world experiences to the students. The best example of this taking place is with ISU's partnership with Texas Instruments. There is a constant interchange between the two institutions. TI sends speakers to present application of the material, and ISU sends students to do basic consulting and documenting of TI's efforts. Although this method is not used as extensively as

would be liked, this is considered one of the best means of getting the material across to the students.

Team teaching does occur, but this is only on a small scale.

Bringing instructors from other disciplines to teach in different departments does not take place as far as Mr. Hetland is aware.

Group discussion techniques take place fairly consistently throughout all classes. There are several classes that are designed strictly to use this type of approach throughout the entire course.

There are several ongoing projects which integrate the use of student teams and real-life scenarios which involve direct communication with local businesses. The best example of this occurring is with the partnership with TI. There is a graduate level course containing 10 students (5 engineering and 5 business) that is working on a real-life problems that Texas Instruments is facing. The students performed benchmarking, analysis, and consulted the firm on the results of the study.

The integration and teaching of quality improvement methods from one course into other is seen only on a limited basis. There is no real structure designed to facilitate this transaction of ideas, leaving most cross-over strictly consequential.

There were three courses that were identified as actively implementing quality education initiatives into their curriculum.

The College of Business's TQM course places the students into teams throughout the semester. These teams are tasked with observing the quality processes within actual organizations. This past semester projects ranged from looking at the college book store to the processes at Jiffy Lube.

The Accounting course also is using team activities to ensure that the students are understanding and able to better apply the information that is provided to them. The main method used to ensure this is taking place is the use of teams. The teams provide a forum to better prepare the students for class.

The Communication Studies course mainly focuses on providing the student with the skills necessary to interview and do presentations. In order to give the students a better understanding of the importance of TQM initiatives, each individual must present on this topic.

The degree to which the students participate in the course development is very limited. The only real manner in

which they have an effect is through feedback about what is
and is not working in the class.

FEEDBACK METHODS

Feedback is gained from the students dealing with the
specific instructor and the specific course. Information
dealing with the educational environment is not done on the
overall feelings of the university, but rather around a
specific issue such as diversity.

For every course, students fill out surveys at the end
of the semester. There are also numerous instructors that
collect information on weekly or bi-weekly basis to better
facilitate their teaching style and material.

The instructor and department chair are provided with
the information gained from this feedback. The main focus
of this feedback is providing the instructor with
information

The feedback provides little change to the actual
curriculum and the course changes depend upon the individual
instructor.

Mr. Hetland was unaware as to whether or not the
students actually saw the results of the feedback, although
he believed that the majority of the changes would take
place after the student left the instructor's class.

The only real method of measuring how well the students
are comprehending and applying quality principles into their
fields of study are through traditional testing methods.

Feedback from the employers is done through the
industry advisory group. This is an excellent tool to
collect information about what the companies would like to
see more of in their new recruits and where the focus should
be directed. The collection of this information has not yet
been done on regular schedule, but during random periodic
discussion with the advisory group.

There are no real measurable scales to determine
whether or not the satisfaction of the employers has
improved over the period of total quality courses. The
students have provided a great deal of anecdotal feedback
that has painted a positive view of the quality course work,
but there is not a real measurable tool to provide accurate
results.

GENERAL FEEDBACK

The greatest success that Mr. Hetland has seen with the total quality efforts at ISU is in area of the cross college course that involved real world problems at Texas Instruments. The past class looked at how to transition from military quality standards into ISO 9000 and what were some of the best practices. This enabled the students to get some good background training and to work as a team to solve a problem at a local organization.

The greatest disappointment that Mr. Hetland ran across is the quick turn over in the student leadership positions of the student chapters of the American Society for Training Development. The group has a strong interest with identifying what the student needs before they get out of school. With this high turnover rate, the feedback that is gained from this group is weakened. The information from this organization has the potential to guide the curriculum into a better tool for the student, but the students do not have enough time in their positions to provide the necessary information.

Once again, Mr. Hetland saw the transient nature of the student groups as being one of the major roadblocks to successfully implementing quality principles into the classroom. Another area that needs to be addressed is the students lack of knowledge as to what will be expected from them in industry. This is becoming less of a barrier as student teams are being sent to local organizations to work on solving problems.

There have not really been any processes that have been found to be ineffective or impractical in the implementation of quality principles.

The first area that would require further development is in the area of moving away from the major focus upon total quality principles. Rather, these processes should be so deeply instilled into the design of the course that a separate course or major would become unnecessary. The next area that needs focus is the continued involvement of the students in improving the classroom and the course.

Although this interview focused mainly upon the academic side of quality, Mr. Hetland pointed out that ISU has also integrated quality into their service side of the university.

TELEPHONE SURVEY SUMMARY

NAME: Ray Hightower

SCHOOL: Kansas State University

POSITION: Assistant Dean College of Engineering

PHONE: (913)532-5592

DATE: 03 June 1996   TIME: 1030-1100

INTERVIEWER: Allen

CURRICULUM DEVELOPMENT

Kansas State University does not offer a degree in quality management.

There is a non-mandatory, one hour course in quality that is taught in a cross-disciplinary method between the College of Management and the College of Engineering. This course provides a general understanding of total quality principles and addresses the views of most all TQM advocates.

Externally, the College of Engineering follows the stringent recommendation of their accrediting board when developing course construction and content. Internally, the faculty senate provides guidance in the general curriculum development.

Changes that have been made to the general curriculum are in the direct focus that has recently been given to quality. For a long period of time, the college has taught the concepts and fundamentals of quality in numerous courses. Now the ideas are formally titled and therefore are addressed as separate sections of courses.

The Architectural Engineering and Construction Science and Management Departments, within the College of Engineering, has really undertaken the implementation of quality management in their administration and education.

Within the general education program there have been cross disciplinary courses for decades. There are not true guidelines for this to take place, this is an ingrained part of the educational process at KSU.

All of the committees at KSU generally have student involvement. The students have limited participation in the curriculum development because they lack the experience necessary to determine what will be necessary in the business world. Alumni input is therefore a more appropriate manner to gain direction as to where to direct the courses.

COURSE DEVELOPMENT AND DELIVERY

The main course that deals with total quality principles is a relatively new addition to the curriculum. The course has been slowly evolving as all new classes do. The majority of the changes to this point were to organize and define the structure of the course.

Kansas State University uses many methods to teach students total quality principles to their students:

Outside employers have been brought into the classroom to bring real world experience to the students for years.

The use of team teaching is left up to the faculty members and the department head to organize and implement. This is a fairly common activity that is used to help the students get a better understanding of the topic.

The use of instructors from outside disciplines and departments are commonly used. There are several secondary majors which are interdisciplinary which require that several faculty members from different departments work together to educate the students in their individual specialties.

Group discussion techniques are used in many situations. The decision to use this educational method is left up to the instructor to decide whether or not it will be beneficial in his particular situation. Although the majority of the instructors like the idea of group discussion, the set-up of the class does not allow for its use. The use of group discussions often limit the number of topics that can be discussed and actually take away from the overall learning experience.

Student team exercises is an idea that KSU feels extremely strong in pursuing. The feedback that has been received from industry indicates that this is a skill that is highly desired and KSU feels that they are among the leaders in providing their students with this ability.

Real-life scenarios are tied into the majority of the courses at the university. The students also work with industry representatives on a project and provide a report

to the individual at the end of the semester with the results of their work.

There is a lack of integration and teaching of quality improvement methods from their TQM course into other courses, this is seen as a weak link in their system. Mr. Hightower feels that they need to bring about this information to their students at an earlier stage of their education so that when these topics are touched on in other classes, there will be a deeper understanding of how it will be applied and integrated.

The total quality course discussed is clearly the most actively implementation of quality education initiatives. The course has seen some great results, and the faculty is driving to take the course a step further. Presently, the course is not mandatory and is only one credit. There is a strong drive to move the course into the core curriculum and increase the credits that it is worth.

The students participate in course development through feedback techniques. By asking the students what would have helped them learn the ideas they perceived the faculty was attempting to teach, a better organization and delivery of the course was reached.

FEEDBACK METHODS

Feedback is gained from the students by two main methods. First is the typical survey questionnaire that is filled out at the end of each semester. This includes information dealing with the instructor, course, and curriculum. The second method is an exit interview with Mr. Hightower. He brings the students into his office upon completion of their degree and gains inputs on areas that need improvement, what methods worked and which did not, and suggestions to make the degree a better overall tool for their future. The department head and faculty see the results of this feedback and begin the process to incorporate these ideas into the curriculum. Both courses and the curriculum see changes from the results of this feedback. Mr. Hightower provided several examples of changes that were direct results of the students views.

There is not a true measure to determine how well the students are comprehending and applying quality principles. Since the quality program is still being developed, most of the concentration has been focused on getting this system in place. The only measure that is incorporated into the class are the testing processes that are used in all courses.

Feedback is gained from the employers through the hiring of their students. While the hiring rate among recent engineering graduates has been around 50%, KSU has seen at least 94% of their students get hired within a few months of graduation. Beyond the numbers of employed graduates, the university gains feedback through an industry advisory group that meets on an annual basis to discuss areas that they would like to see more focus placed. This committee is run though the dean's office, but information is provided to the department heads and the faculty.

It is difficult to measure the satisfaction of employers due to the lack of quantitative data.

GENERAL ISSUES

Although the teaching of the quality principles are still relatively new to the university and the majority of the guideline that the students will use on their jobs will be taught to them by their employers, Mr. Hightower feel that the program is providing a strong foundation for the students to take with them to the job.

The greatest disappointment is seeing students a couple years after completing the quality course and not applying the information that was taught to them.

The major roadblock encountered while trying to bring quality principles into the curriculum is the reluctance of the faculty to give up time and credit hours to information that could be picked up on the job. These instructors are having difficulty getting across the information that they believe is required from their subject.
The newer faculty is much more willing to incorporate this information into their classes.

Mr. Hightower believes that although the ideas and principles behind quality initiatives need to be brought to the students, he finds that some of the processes are extremely time consuming and provide little return. Therefore, there needs to be a method to eliminate teaching those processes that are not as beneficial to the students long term gain.

Future improvements to the course should provide the students with numerous exercises that ensure application experience so that the information is not forgotten.

TELEPHONE SURVEY SUMMARY

NAME: Major Karl M. Johnson

SCHOOL: Air University: Air Command and Staff College

POSITION: Chief, Command Leadership and Command Studies
Division

PHONE: (334) 953-2952   DSN: 493-2952

DATE: 15 May 1996   TIME: 0900

INTERVIEWER: Koizen

CURRICULUM DEVELOPMENT

Air University's Air Command and Staff College (ACSC) is a
military school designed for the upper mid-level military
staff officer, leader, and commander. The school runs for
10 months and is divided into two distinct 5 month
semesters. There are approximately 600 students enrolled in
any given class which typically represents Air Force Majors
and Major selectees. There are approximately 80
international students, and a mix of 44 Navy, Marine and
Coast Guard officers, and Army officers. The student body
is broken down into 43 individual seminar units. Each unit
contains 1 land officer (Army), 1 sea officer (Navy, Marine,
Coast Guard), 2 international officers, and 10 Air Force
officers. Each seminar will rotate students after the
initial 5 month semester retaining the same land, sea, air
and international mix. The curriculum is broken down into
ten distinct courses which include:

> War Conflict
> War Theory
> Strategic Structures
> Operational Structures
> War Termination
> Joint Operations and Campaign Concepts
> Airpower and Campaign Planning
> Joint Warfare
> Leadership and Command
> Force 2025

There are no degrees awarded from the school and, as such,
there are no majors the students must select. Major Johnson
is responsible for lesson development and faculty

preparation for leadership and command studies division at ACSC. This division is subordinate to the Department of Command and Strategic Studies.

Quality concepts are taught within the Command Leadership and Command Studies Division. The curriculum consists of one 2 hour core seminar which discusses quality concepts, organizational structure, organizational culture, quality structure, and various other quality activities. The main focus of this instruction is on the application of various quality tools necessary for the successful leadership of an organization. The course is designed to assist the Air Force leader in his or her ability to determine the quality culture in an organization and what quality tools are appropriate to affect positive change on that culture.

There is the presumption that in-coming students will arrive at ACSC with a basic understanding of quality and the philosophy which revolves around quality concepts. Major Johnson comments that the Department of the Air Force believes that Air Force personnel have reached a point of saturation in exposure to quality concepts. Because of this, ACSC has reduced the amount of coursework in quality commensurate with higher headquarter's directives. A potential exception is with international students who are responsible for additional course work which provides the necessary prerequisite quality knowledge.

No specific advocate or approach is utilized at ACSC, rather a breadth of authors and approaches is presented. The current textbook is "Beyond Total Quality Management" by Bowens, York, Adams, and Ranney.

Formal guidance for curriculum construction and content is detailed in the Instructional Systems Development (ISD) Model. This model includes five phases for development of curriculum and applications for their respective management aspects. The five phases are: Analysis, Design, Development, Implementation, and Evaluation. The model is detailed in Air Force Manual (AFM) 36-22-36, Guidebook for Air Force Instructors, and AFM 36-22-34, a fourteen point instructor's handbook. These guides provide information for curriculum construction in any area, not just in quality.

Because ACSC graduates are expected to be leaders in their organizational culture, they are expected to recognize the processes used and the validity of subordinate Process Action Teams (PAT), as well as be prepared to act as a member on a higher level PAT.

Exposure to quality in the classroom has become less
prevalent than it was 3 years ago at ACSC. Today, the
general curriculum focuses heavily on leadership and the
leader advocating his or her team in quality. There is a
heavy emphasis on the leader's ability to synthesize and
analyze situations.

The Leadership and Command division has had the most active
implementation of quality education initiatives at ACSC. At
this time, however, there are no effective measurements or
feedback methods to assess the results of these initiatives.

Guidelines to teach across disciplines or offer multi-
disciplinary subject material remains much as it was in
1993. Informal guidance, in the form of, verbal directives
originates from the Commandant of Air University.

Students do not actively participate in general curriculum
or program development.

COURSE DEVELOPMENT AND DELIVERY

Changes made to the coursework include a greater emphasis on
teaching the student to understand the environment they work
in, along with the relationships and culture inherent in
that environment. Many of the quality courses which focused
on metrics are viewed as being no longer applicable and were
taken out. These courses have been replaced with more
leadership courses and courses which teach how to understand
relationships between people, along with the analysis of the
students own abilities and the abilities of others. Quality
courses at ACSC have been re-engineered more towards the
social sciences than mathematical analysis.

ACSC uses the following methods to help students comprehend
and apply total quality principles:

     Outside employers, in the form of senior military and
civilian business leaders, are still utilized extensively at
ACSC. Most lectures focus on applications of leadership.
     Team teaching is not currently used, except in the
planning processes only.
     Group discussion techniques are used extensively. Most
classes are taught in a seminar format where students are
expected to share in the teaching process. Life lessons and
real life experiences are sought in this environment. It is
not uncommon for the instructor to act simply as a
facilitator in this scenario.

Student teams, especially in the campaign planning area, are used throughout the coursework.

Real-life scenarios are used as much as possible. The school searches for ways to exploit technology, such as in areas where satellite imagery can bring real-world, real-time data to the classroom.

The Air Campaign coursework provides the students the most active implementation of quality initiatives.

Students do not generally participate in course/lesson development.

FEEDBACK METHODS

Feedback is obtained from the students on a daily basis. Each student is given a 486 notebook computer on which all of the days assignments are downloaded. After completing the assignments, 3 of the 14 seminar students are asked to critique the lessons on presentation, ability to understand, technology, approach, and level of difficulty. There is a final end of course critique given to all students upon their completion of ACSC.

The critiques are forwarded to a neutral third party for review. Changes made to the curriculum because of student feedback is not dramatic. If a student suggests a good idea, they may be asked to elaborate and expand on that idea for inclusion into the general coursework. Furthermore, if there are visible trends in student critiques, such as a significant number of students viewed a course as particularly easy or difficult, than the course can be adjusted. Students are unlikely to see any results of their feedback in the short term, but are more likely to see changes in over the course of the program.

Feedback is obtained from the student's gaining commanders one year after graduation. Surveys are sent asking the graduate's commanders if the curriculum was effective, if they are receiving better strategic thinkers, better critical thinkers, and leaders who are willing to question and "think outside the box." Although there are no long term surveys sent to the commands, there are plans to accomplish similar feedback methods at the three and five year points.

GENERAL ISSUES

Major Johnson believes one of ACSC's great successes is allowing flexibility in technology. Allowing students to apply their own level of thinking and analysis at a quicker pace, with greater impact, in a shorter period of time.

One of ACSC's greatest challenges is overcoming the negativity and misunderstanding often associated with quality. Major Johnson agrees that the Air Force may have attempted to do too much too fast and in the process they may have alienated some Air Force personnel along the way. Through attrition, many of the negative feelings often associated with quality go away. It is ACSC's challenge, along with the Air Force as a whole, to reach the more junior officers early in their careers and demonstrate to them that quality can not only be applied to Air Force issues, but it can be applied in everything the students do.

NAME: Mary Kurta

SCHOOL: University of Michigan

POSITION: Associate Director of Resource Planning

PHONE: (313) 763-4713

DATE: 03 May 1996   TIME: 1300-1340 (EST)

INTERVIEWER: Allen

CURRICULUM DEVELOPMENT

The University of Michigan does not offer a major in the degree of Quality Management.

There is one course, Total Quality Management, available in the College of Engineering. This is a senior level course that is an elective for those that are interested in the topic. Although this is the only formal class that is offered in the topic, TQM ideas and principles have filtered into many of the other courses.

There is no written, formal guidance that is provided to the instructors as to how to teach and develop their course work, however the different departments do basic guidelines that they pass along to their instructors.

There have recently been some major changes to the curriculum at the University of Michigan. Mrs. Kurta was unable to elaborate due to the fact that the curriculum committee had just met and she was not present on the decision panel. The results of this decision are intended to provided the engineering students with a knowledge base that will be better applied to industry instead of academia.

All the departments in the school of engineering have taken an active role in including more total quality principles and concepts to their area of study.

There are really no guidelines available for teaching across disciplines. Normally, the professors will move departments to fill the needs of the school. In order to maintain an even class size across the institution, the instructors follow the student demand.

The students are invited to participate on the decisions that will affect their future curriculum. In the recent curriculum committee panel, 4 of the 25 members were students. Their comments were considered and their votes counted on the end results.

COURSE DEVELOPMENT AND DELIVERY

Evaluations are done at the end of each year and changes made according to the feedback received.

The instructor of the Total Quality Management course is the president of a private corporation and brings much of the real world knowledge with him into the classroom. This applied knowledge of being in industry everyday gives him more credibility and understanding beyond the academic walls. He also invites other business leaders into the classroom to provide their knowledge to the students.

Team teaching is used when there are other instructors available that have a greater depth of knowledge, but this does not take place as often as outside business leaders.

Group discussion and team exercises are used extensively throughout the course. Over 50% of the courses are set aside for these types of activities.

Real-life scenarios are brought into play wherever they can play a role in the development of course concepts. An attempt is made to bring examples from both industry and academia so that all students needs will be addressed.

The integration of other courses into the Total Quality Management course is not done often.

The one idea that is used in this course is the idea of bringing back previous students to talk to the class. These former students explain how the ideas that they gained from this class played a role in following classes and outside the academic walls.

Students do not actually participate in the curriculum development for the course except through feedback methods that will be applied to future offerings. It was previously attempted to allow the students to include input as to where they wanted the course to go at the beginning of the course. This was an unsuccessful approach because the majority of the students entering the class had little knowledge on the subject and could not direct the future of the discussions.

FEEDBACK METHODS

Feedback is collected from the students in the form of surveys. Information dealing with the instructor, course, curriculum and the educational environment are collected. Feedback is solicited twice during each course, and then a comprehensive questionnaire is given before graduation. Starting this past year, the school began collecting feedback from students that graduated two years earlier. The student feedback is available to just about anyone. Tabulated data is placed in the library so that prospective students can make more informed decisions as to which instructors they chose to take classes with. The feedback is provided to the curriculum committee so that they can provide a better educational experience to the students.

The only real methods of evaluating the comprehension and application of total quality concepts in the students is through basic testing scenarios.

Since this was the first year that past students had been included in feedback, it has been difficult to question the employers directly. The only form of employer feedback is on an informal basis through recruiters. A program to begin searching out this information is being considered for the near future.

GENERAL ISSUES

The greatest success that has been seen is the transition from individual assignments to more use of team and group work. This vantage point is more realistic of what the students will be seeing in the real world.

The greatest disappointment is the mentality of the faculty and administration wanting to keep things as they have been in the past. There is a strong resistance to change and adapt to the new ways of thinking.

The roadblocks that have been experienced are once again the resistance to change in the faculty and administration.

There really have not been any processes that have been found to be ineffective or impractical.

Mrs. Kurta would like to see the future of total quality efforts to become so integrated into the separate disciplines that there would no longer have to be a single

course dedicated to TQM. Every class would teach the ideas and not think about it being anything other than a required practice within that subject.

TELEPHONE SURVEY SUMMARY

NAME: Lt. Col. James Lowe

SCHOOL: United States Air Force Academy, Department of
        Management

POSITION: Associate Professor

PHONE: (719) 472-3122   DSN: 259-3122

DATE: 30 April 1996   TIME: 1500-1545

INTERVIEWER: Allen

GENERAL DEVELOPMENT

Although there is no major offered in quality at USAFA
(United States Air Force Academy), there are several courses
that deal with quality improvement concepts. TQM is not
taught in a specific course, but is integrated into classes
dealing with separate topics that are enhanced by the
introduction of quality concepts. There are two main
courses that are mandatory for all students, which introduce
total quality principles to their students. The core
statistics class introduces the ideas that are involved in
statistical process control, while the core management class
introduces the teachings of the early philosophers of
management providing a foundation for the learning of more
TQM based philosophers.

There is formal guidance for the curriculum
construction and content through the Center for Educational
Development. This office provides guidance for the
development of curriculum, along help with lecture and exam
development. Brown bags (a short briefing over lunch) and
written items are provided to instructors periodically to
keep everyone up on the latest developments. This guidance
is more on the general concepts of teaching than the
specifics of actual courses; therefore, there is no specific
consideration dealing with the topic of quality.

As an institution, USAFA has made changes in the
curriculum to attempt to include more of the concepts of TQM
into the core courses so that concepts can be applied to any
area that the students may be working. Personally, Lt. Col.
Lowe has attempted to get the ideas of using data for
analysis to become more heavily stressed. Without

understanding the data that is available, it is impossible to make an informed decision.

Because of Lt. Col. Lowe's direct tie to the Management Department, he felt uncomfortable speaking on behalf of the other departments adoption of quality education principles.

The one area that can see the cross discipline and multi-disciplinary teaching is that of Operations Research (OR). This degree requires that the student gain a wide base of education from several separate departments. The OR program sees itself having several separate clients: students, OR discipline, and the scientific analysis career field in the Air Force. It gets difficult to attempt to constrain or refocus instructors in disciplines that fall into other departments to eliminate overlap. It now is becoming more open to address other departments and it is creating a set of goals and outcomes that all courses are now able to compare their curriculum with.

There is no active student participation in the development of curriculum or programs. Enrollment plays a factor, if students do not enroll in a class, it will be redeveloped or removed from the program. Their only real influence comes through feedback that will be addressed during Section 3.

COURSE DEVELOPMENT AND DELIVERY

The ideas of the changes that have been made to the courses were either previously addressed in previous questions or in questions that follow.

USAFA uses several methods to teach their students the ideas and concepts of total quality:

Outside employers, business leaders, and Air Force leaders are invited to most of the management classes to add their expertise to the curriculum. There is also a seminar course that is almost entirely guest speakers.

Team teaching is done. This is not a department mandate, but is left up to the individual instructors. Lt. Col. Lowe believes that it is an idea that would most likely be accepted by the majority of the instructors, but schedules and availability are limiting factors keeping it from becoming more prevalent.

Instructors from other departments are brought in to teach within the management department.

Group discussion techniques are used in every class.

Student team exercises are used through projects and case study techniques. Group team building exercises are also used, but fall more into the Behavior Sciences Department.

Real-life scenarios are brought into the classroom though case studies, problem sets, and in all areas that are applicable. Students are also sent out to businesses to study the application of the ideas that have been introduced within the class discussions.

Problem solving and learning is the main focus of all the departments, integration of the different disciplines is perhaps the only method of successfully reaching this goal.

The capstone course allows for the integration across disciplines. This course begins with the use of case studies, then builds upon this level of understanding by having the student applying this knowledge with local business through consultation.

The students do not participate in the process of course development, their voice comes into play through feedback methods.

FEEDBACK METHODS

Feedback is gained from the students by the use of mid-course and end-of-course critiques. Some instructors also like to include weekly critiques for their own personal knowledge. This feedback is collected on the specific instructor, the specific course and the curriculum as a whole. Feedback on the university educational environment is collected through another source. The information from this feedback is seen by the specific instructor and a collection of the senior staff in the department. This feedback affects the curriculum immediately, sometimes the changes are almost too quick. The student rarely sees the results in the majority of the feedback because they are not present for the next session of the class, but the effect of the mid-course evaluation can sometimes be seen.

Feedback is being collected from both the graduates and their bosses to see if their students have been prepared for their jobs. This will be the first year that this is being done in the Management Department, but the Operations Research Department has done this several times in the past. This collection has been pretty sporadic and little long term information can be seen from this technique. As this becomes more consistent, the department will be better able

to focus their line of education on preparing students for service in the Air Force.

Because the collection of the employee satisfaction instrument has not been done consistently over time, there has been no cross year comparison.

GENERAL ISSUES

The greatest success that has been seen is the problem solving approach of moving back and seeing the whole picture instead of strictly focusing on the details.

The greatest disappointment is the lack data analysis in the courses other that those directly involving statistics. It is difficult to get across the idea that informed decisions can not be made without understanding the data that has been collected.

The greatest roadblock is the administration aspects of the military academy. The students are unable to leave campus when the want to do visits with local businesses to see their education being applied in the real world.

The least effective practices are the daily graded homework assignments. Students seem to just go through the steps to complete the assignment instead of trying to understand why and how this activity is applied in their education.

The students should be allowed more flexibility, autonomy, and decision making that is not allowed at the Academy. It is a difficult argument between the military and academic sides of the institution.

NAME: Dr. Paul Roush

SCHOOL: United States Naval Academy

POSITION: Head, Ethics Department

PHONE: (410) 293-2114   DSN: 281-2144

DATE: 19 June 1996

INTERVIEWER: Koizen

CURRICULUM DEVELOPMENT

Quality education at the United States Naval Academy (USNA)
has changed dramatically over the past three years.
Curriculum development is influenced by the academy's
leadership through the school's superintendent. As the
administration changes, so do the areas of emphasis. The
school's current leadership has eliminated all Total Quality
Management classes and replaced them with a mandatory ethics
course. The academy believes that Total Quality Management
classes were over-emphasized, and force-fed at the
institution, thus they have been eliminated from any formal
curriculum. It is believed that quality training should be
accomplished after graduation at the unit level.

Because teaching quality concepts and philosophies has been
drastically reduced, no advocate nor approach is emphasized.
Furthermore, Dr. Roush is not familiar with any formal
guidance for establishing curriculum construction or
content.

COURSE DEVELOPMENT AND DELIVERY

The changes that have been made to the general curriculum
structure regarding total quality principles centers around
the elimination of the courses which taught quality.
Students do not receive any formal education on total
quality. The classes that were canceled were replaced by
ethics courses. Ethics, as a subject, is taught both
through individual, specialized courses as well as weaving
topics dealing with ethics into other core curriculum.

Changes made to particular courses dealing with total quality principles resulted in the elimination of those courses.

Group discussion, real-world scenarios, and case studies are used extensively in the ethics courses. To a lesser degree, team teaching and outside employers, business and military leaders are used in the education process.

FEEDBACK METHODS

Feedback is solicited through end of course critiques and end of week critiques. At the end of the lecture week, one third of the 18-20 students in the ethics classes are selected to electronically provide feedback about that week's lecture. Feedback on level of difficulty, amount of time spent in preparing for the class, and quality of instruction are some of the questions asked on a Likert-type questionnaire. The end of quarter critiques are issued to all students soliciting the same information. Feedback is reviewed by Dr. Roush, the department head, and by the instructor's involved in the course presentation. If any trends are realized, changes to the course content or presentation style are considered.

Students demonstrate knowledge of reading assignments and course content by providing numerous term papers and talking papers about assignments. Students are also given exams which challenge their comprehension and understanding of the coursework.

Attempts have been made to obtain feedback from various Naval commands regarding academy graduates, however, because this information is difficult to obtain the feedback received has been lacking. Success of academy graduates is best demonstrated through their performance reports, promotion rate, and length of stay in active duty.

GENERAL ISSUES

Dr. Roush explains his greatest success is exposing midshipmen to classical theory regarding ethics. Weaving ethics into courses such as history or political science, and the ability to demonstrate how ethics plays a role in such varied disciplines is crucial to the well-rounded academy education.

A disappointment for Dr. Roush is seeing the elimination of previous courses dealing with quality. There is a concern that students are missing out on some valuable information and it is a challenge to graduate knowledgeable students in this area without specific courses dealing with quality. Furthermore, overcoming attitudinal roadblocks concerning total quality is an on-going concern.

TELEPHONE SURVEY SUMMARY

NAME: Sheryl Stanley

SCHOOL: Kansas Newman College

POSITION: Assistant Professor of Business and Total Quality
Management/Director of Total Quality Management
Degree Program

PHONE: (316) 942-4291 x232

DATE: 05 June 1996   TIME: 1500-1530

INTERVIEWER: Allen

CURRICULUM DEVELOPMENT

Kansas Newman offers a minor, an associates degree, and
a bachelor degree in total quality management. The
curriculum is basically a business degree with emphasis in
the areas of quality. The bachelor degree curriculum
requires 54 total hours as follows:

        ACCT 2023 Prin of Acctg
        BSAD 2013 Prin of Mgt
        BSAD 3013 Prin of Mktg
        BSAD 3043 Organizat Behav
        BSAD 4033 Marketing Research
        CIS 1003 Intro to Microcomputers
        CIS 3033 Spreadsheet Analysis
        ECON 2013 Prin Econ 1
        ECON/MATH 2033 Prob & Stat 1
        ENGL 3093 Bus & Prof Writing
        MATH 1043 College Algebra
        TQM 3003 Concepts of Total Qual Mgt
        TQM 3013 Qual System Models
        TQM 3033 Stat Proc Control
        TQM 4003 Lead & Group Dynamics
        TQM 4073 Strategic Qual Mgt
        6 remaining credits electives

There are several courses that deal with the topics relating
to total quality management. These courses are mandatory
for those individuals that are working toward a degree in
TQM and is open as an elective for other students. The
courses do not focus upon a particular advocate or approach

and Mrs. Stanley feels that it would be inappropriate to teach the course in this manner. The courses cover a broad range of teachings and various elements of quality.

Changes to the curriculum content first occur within the TQM department, then are forwarded to the business division, and then to the academic council. Once changes have been approved, the faculty, as a whole, is given the opportunity to vote on the new curriculum. New programs are taken several steps further with the leadership team and the board of directors providing their input to the decision. This collaborative decision making process allows all academic parties to add their opinions and to include their input.

The TQM degree program began six years ago with Boeing asking for proposals from universities to work with them jointly in creating a quality degree. The early years of this degree were very military focused with specifications, procurement, and performance being the major drivers. Soon afterward, a TQM advisory committee was formed using members from the community that were heavily dealing with quality in their organizations. This has allowed the curriculum to grow into a broader base with differing avenues of focus.

The principles of TQM come very natural at Kansas Newman and are integrated into all facets of the university. As far as integrating formal structured initiatives, Administrative Services has incorporated the ideas furthest to ensure that all the employees have a voice in decision making, provided much team training, and created methods to collect data from students that was not possible before. Much of the focus upon TQM has been placed on the degree instead of on implementation due to the strength of quality principles within the departments.

There is no formal guidelines available for cross discipline and multi-disciplinary courses. Teaching across disciplines is a fairly common practice. Due to the small size of the university, this practice is readily welcomed and encouraged. Presently, there is a multi-disciplinary humanities course available for the students to take.

There are student representatives on all of the decision making committees at the university.

COURSE DEVELOPMENT AND DELIVERY

It is impossible to list the numerous changes in the quality courses during the past six years. The previous section hinted at many of these changes and should provide an understanding at the direction that Kansas Newman is directing their degree. The small size of the school and the great latitude that is provided to the faculty allows changes to occur quickly and to accommodate new approaches and ideas.

The institution employs the following methods to help students comprehend and apply total quality principles:

Outside employers are brought into the classroom to talk with the students. The contacts made through the advisory council allow a great variety of speakers to provide their input and opinions.

Team teaching is done on a small scale. The one roadblock to this technique is that it is not financially supported. Teachers using this approach would be forced to divide the salary that is paid by the course. Mrs. Stanley feels that the best use of this technique is when the class is attended by both the instructors, which this pay method discourages.

Instructors from other disciplines are invited to talk to the classes about their area of expertise.

The faculty is trained in the techniques of leading group discussions. Students have about a twenty minute attention span, getting them involved in the discussions lengthens this time and provides a better environment for learning. Most of these students have a great deal of experience, getting them involved provides relevant information that helps facilitate the learning process.

Team exercises are used in many of the classes, including one class where the entire grade is determined by group activities.

Real-life scenarios are done in all classes. The experience of the instructors, case studies, and direct interaction with local businesses are included to ensure that students gain a true understanding of how the lessons are applied.

There are five core courses required for the TQM degree. All of these courses have deeply imbedded the ideas and principles of the quality process. The result appear to be quite excellent at this time, but the courses are also adapting to meet the needs of the employers.

The students participate in course development through their participation on decision making committees and through other feedback methods.

FEEDBACK METHODS

Feedback is gained in several ways. The main technique is through a student survey filled out at the end of the course. These results are tabulated and sent to faculty members, department heads, and to the Faculty Evaluation Committee. This student feedback is a major factor for promotion, tenure, and retention. There are also several student groups that provide feedback.

Information is gained on the instructor, course, curriculum, and the university educational environment.

The student feedback is considered when redesigning the courses or to help spot areas that need additional focus.

There is no formal method for the students to see the results of their feedback. By observing the changes that occur year to year many of these changes can be seen, but this is the only method.

Students are evaluated in their class work, but they are not measured in how well they are comprehending and applying quality principles within their fields of study.

Feedback is not gained from the employers of the graduates other than through the Advisory Council which meets once a month.

There appears to be a great deal of satisfaction with the quality curriculum. The model that Kansas Newman has used has been replicated at several other universities.

GENERAL ISSUES

The greatest success that Mrs. Stanley has seen in the efforts to enable students to comprehend and apply total quality principles is in their ability to get the students to apply what they are being taught. By having students visit local organizations and work with them directly on a problem it enable the students to better understand the details they are being taught.

The greatest disappointment is when students take a class and complain later that nothing is happening in their workplace. The students are filled with ideas and are unable to get anything implemented into their organization.

There have been no real roadblocks that have been encountered. The faculty and students are very eager to get the process moving. It has not been all easy, but there are no major roadblocks.

The students want to get their hands dirty and learn the information. If you have faculty that wants to strictly teach from the book and have no real world experience, the student will get frustrated and the learning is ineffective.

Mrs. Stanley would like to see the discipline of total quality management become more integrated into everything else that the university teaches. This is a goal that the university is attempting to accomplish. Having a TQM degree next door to a general business degree is not the most productive manner to teach the subject. Somehow, these two disciplines must meld to something beyond where they are now.

NAME: Joe Thomas

SCHOOL: Cornell University

POSITION: Professor of Manufacturing

PHONE: (607) 255-4854

DATE: 29 May 1996   TIME: 1500-1530

INTERVIEWER: Allen

CURRICULUM DEVELOPMENT

Cornell does not offer a major in Quality Management.

Formal courses in quality are taught at Cornell University. The Operations Management course is a mandatory course for all MBA students, although the main focus of this class is not quality, there is a section that concentrates strictly upon this subject. There are several other courses that also follow this approach of integrating the topic of quality into their curriculum, but the majority of these courses are not mandatory. The main course that addresses the subject of quality at the university is within the elective Total Quality Management. There is no particular advocate or approach that is focused upon, each idea is studied and the overall understanding is what the course hopes to pass along to the students.

There is no formal or informal guidance for the curriculum construction and content. The faculty is allowed to develop and mold their classes as they see necessary.

The addition of the TQM course was developed about six years ago and is the largest change to facilitate the teaching of total quality principles. During the last two to three years, the addition of a field project has provided the students with hands on experience with quality principles.

The Operations Management Department has most actively adopted quality education initiatives in their course work that will later be used within our daily lives. This improvement can be seen in the changes to course work and the addition of outside projects.

There are no guidelines for teaching across disciplines but it is highly encouraged. There is a core curriculum coordination committee that looks at the concepts that go across these borders.

Students have an input into general curriculum and program development through their inputs on committees that look at curriculum redesign.

COURSE DEVELOPMENT AND DELIVERY

The changes that have been made to the individual courses to teach students quality principles was previously addressed in Section 1.

Cornell uses numerous methods to teach their students the principles of total quality management:

Outside employers are invited to talk to the students. CEO's from companies such as Ford and Union Carbide have come to talk about quality initiatives. The individuals that are actually in the trenches doing the quality work in organization such as Sprint and Cornell have come to discuss the difficulty that they are encountered and the realities of implementation.

Team teaching is used, but not on a consistent basis. The use of instructors from other departments is even less commonly seen.

Group discussion techniques and student team exercises are seen in all courses and are an integral part of the teaching process.

Real life scenarios are often used at Cornell, from the actual visit to an organization to written case studies.

It is assumed that individuals have taken and maintained knowledge from their other courses; therefore, information from these courses are referred to and discussed within other classes.

As discussed during Section 1, the Operations Management course has most actively implemented quality education initiatives.

The students participate in course re-development. This is done through constant student feedback that the faculty member takes to re-design the course.

Student feedback is gained from students through several techniques. First, there is a required course evaluation that includes both qualitative and quantitative means. Focus groups are another feedback method that take place throughout the semester. Narratives are used at the end of the semester to suggest improvements. These are not the sole methods that Cornell uses, but are the most common techniques that are seen. The instructor and course are evaluated in all of the separate methods. The entire curriculum is looked at periodically when it is being redesigned not done all the time. The university itself looks at questions referring to the educational environment, but the individual colleges do not. The faculty member that is being evaluated sees the results of the entire survey and the quantitative portion then becomes public property and is available for anyone to obtain. The feedback changes the course by pointing out the strengths and weaknesses to the professor.

The only real measure in determining how the students are comprehending and applying quality principles are through normal testing methods.

Feedback is gained from the employers of graduates through several techniques. First, information is gained anecdotally when the employers arrive to recruit. A luncheon is scheduled and discussions between faculty and the employers take place. When major changes are taking place within the school, the university goes to the employers and generically asks what changes are needed. This feedback is mainly seen by the faculty and administration.

GENERAL ISSUES

The greatest success that Mr. Thomas encountered with the implementation of total quality principles is the use of real-life cases. This allows students to see that the tools are not perfect and need to be adapted and used creatively in order to work effectively. Hands on experience provides the students to actually use the skills that they have learned, providing them with a better understanding and recall of the processes.

The main disappointment is the low attendance in elective TQM courses. There is currently an attempt to make the course more attractive by integrating more real-life situations and better mold the course for future application.

There have been no major roadblocks that were encountered in the efforts to enable students to comprehend and apply total quality principles.

There are no real processes that have been encountered that have been impractical or ineffective.

Further improvements that Mr. Thomas would like to see would be the increased interest of students toward the topic of total quality.

TELEPHONE SURVEY SUMMARY

NAME: Major Matt Warren Thomas

SCHOOL: Air University: Air Force Quality Institute

POSITION: Chief, Curriculum Development

PHONE: (334) 953-3888   DSN: 493-3888

DATE: 8 May 96   TIME: 0830-0930

INTERVIEWER: Koizen

CURRICULUM DEVELOPMENT

The school's primary focus is on training rather than
on education. Because of this, no formal majors in Quality
are offered. The training received here is considered
"Just-In-Time" training versus the "Just-In-Case" education
received in other Air Force Professional Military Education
(PME) courses. Just-In-Time training meets the immediate
needs of the Air Force by providing trained educators,
competent in delivering quality training at the
organizations from which they came. Just-In-Case education
is taught with the intention that the knowledge gained there
will someday prove valuable in a future position.   Any Air
Force member from the rank of Technical Sergeant to
Lieutenant Colonel can attend a course in any one of five
areas of emphasis or executive overviews. Courses offered
are listed below:

Quality AF Instructor's Course

The Quality Air Force Instructors course can accommodate any
Air Force member from the rank of Technical Sergeant to
Lieutenant Colonel. It is a ten day quality academic
instructor's school designed to get new Air Force quality
instructor's spun-up on education philosophies and
techniques, as well as providing education in the latest
advances in quality concepts and approaches. Members are
expected to come to class already aware of core concepts
such as; facilitator training, team member, team leader and
quality awareness.

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Quality Air Force Advisor's Course

The Quality Air Force Advisor's Course is a four day seminar taught to Air Force members from the rank of Technical Sergeant to Colonel. It is geared towards individuals who will assume the role of an organization's quality advisor, teaching them the roles and responsibilities necessary to be a quality advisor to a senior Air Force leader.

Overview of Benchmarking

This three day tele-seminar provides instruction for individuals responsible for benchmarking at a major Air Force installation. It includes an Executive Overview for senior leaders teaching benchmarking concepts, the senior leader's role and responsibilities, and provides guidance for some of the ethical considerations a senior leader may face in the benchmarking process.

Unit Self-Assessment Course

This three day tele-seminar, while still in its infancy, will provide an overview for individuals assigned to a unit self-assessment team. It will provide guidance and instruction on the roles and responsibilities of a team member and provide the tools necessary to perform in that capacity. It includes instruction for senior leaders on the role they assume in dealing with unit self-assessment teams.

Strategic Planning

This four hour executive overview course explains why strategic planning is important, its benefits, how strategic planning is linked to other plans in your organization and how quality plays a role in the strategic plan. It also provides guidance for the senior leader in helping define their roles and responsibilities. While not a how-to course, it does provide some instruction in understanding gap analysis, action planning and assessments. The school also provides consultants who can facilitate individuals through the strategic planning process at the organization level.

Courses are mandatory only for those individuals who are tasked to provide instruction or expertise at the organizational level. There are no mandatory courses however, individuals attending the Air Force Quality Institute are expected to have taken certain prerequisites or core courses which are taught at the Wing level. Students must arrive knowledgeable about facilitating,

being a team member and leader, TQM awareness, teams and
tools, and metrics.

Formal guidance for curriculum construction and content is
detailed in the Instructional Systems Development (ISD)
Model. This model includes five phases for development of
curriculum and applications for their respective management
aspects. The five phases are: Analysis, Design,
Development, Implementation and Evaluation. The model is
detailed in Air Force Manual (AFM) 36-22-36, Guidebook for
Air Force Instructors, and AFM 36-22-34, a fourteen point
instructor's handbook. These guides provide information for
curriculum construction in any area, not just in quality.

COURSE DEVELOPMENT AND DELIVERY

In-class applications, exercises, and role playing are all
used at the institute to facilitate the learning process.
These teaching techniques are used even more extensively
during the prerequisite courses taught at the wing level.

Although students are not directly involved in curriculum
development, major command (MAJCOM) level quality advisors
participate in course preparation and development.

Outside employers in the form of Wing commanders and Group
commanders are frequently invited to talk to the students.

Team teaching methods, group discussion techniques, student
team exercises, and real life scenarios are all a part of
the education environment.

The strategic planning and benchmarking courses offer the
most pertinent examples of active implementation of quality
education initiatives.

FEEDBACK METHODS

Feedback is obtained from the students in several different
manners. The first method is an Alpha/Beta test. The Alpha
test is given when the course is initially coming on line.
A group of experts is invited in to review the course and
their comments and suggestions are solicited. The Beta test
is given to a target group of students. Comments and
suggestions are obtained from the student group in much the
same way as the Alpha group. Another method is gathering
interim feedback is obtained from students in an informal
manner by asking them to "rate" the course using a plus and

minus system.   This provides the instructor real time data
helping them determine the strong and weak points in their
curriculum as the course is in session.   Finally, where
practical, feedback is solicited from graduates 4-6 months
after graduation.   This is accomplished through a
survey/questionnaire using a Likert-type scale.   Specific
areas for feedback include how the instructor performed, the
applicability of the course content and delivery, and the
technology used to present the information.
Feedback is reviewed by the instructors and the institute's
administration.

GENERAL ISSUES

According to Major Thomas, meeting the needs of the Air
Force through quality instruction is one of the greatest
successes of the institute.   The more a course is demanded,
the greater the satisfaction in knowing that the school is
providing a service viewed in high regard by its service
members.   Awards received by graduates in the quality arena
also provides a sense of accomplishment and pride for the
institution.

Some of the challenges the institution faces is making
students aware that this is a management philosophy not a
program.   The Air Force has seen many programs come and go.
This school wants its graduates and employers to realize
that Quality Air Force (QAF) is an initiative which attempts
to institutionalize the way you lead your organization.   It
is not simply a passing fad.   Impressions by the general Air
Force population have been equated to a 20-60-20 mentality.
That is 20% of the population is enthusiastic about quality
in the Air Force and are committed to seeing it succeed.
60% are mediocre about its success or failure and the
remaining 20% are skeptics.   Furthermore, there is a lot of
criticism about the QAF criteria or Baldridge criteria.
Many senior leaders feel it is too complicated and needs to
be made applicable to Air Force personnel.

Major Thomas hopes to see the creation and implementation of
a core of competencies in all Air Force PME schools.
Although this would appear to be common sense, standardizing
this education has been elusive.   It is crucial to the
success of quality that the Air Force create a common
language with a core curriculum and set of objectives which
is taught throughout the Air Force.   Recent developments and
cooperation across all Air Force commands have brought this
goal within reach.

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VITAS

Captain Joe Koizen earned a Bachelor of Science degree in Political Science from the University of Scranton, Scranton, Pennsylvania, and was commissioned through the Air Force ROTC program in January 1988. Captain Koizen is a graduate of the Air Weapons Controller School at Tyndall AFB in Panama City, Florida, and the Semi-Automated Weapons Controller School at Luke AFB in Phoenix, Arizona. He has also attended the Automated Weapons Controller School at Tyndall AFB and the Supply Officer's Course at Lowry AFB, in Denver, Colorado. His first duty assignment was as a Weapons Control Officer in the Federal Republic of Germany. Cross-training into Supply in 1991, Captain Koizen served as a Supply and Executive officer at McChord AFB, Tacoma, Washington. In May 1995, he was selected to be a candidate for the degree of Master of Science in Contract Management from the Air Force Institute of Technology (AFIT). Following graduation from AFIT, he will be assigned at the Space Systems Center, Los Angeles AFB, California.

Permanent Address: ████████████

2nd Lt. Mike Allen earned the degree of Bachelor of Science in Management from the United States Air Force Academy in May 1995, at which time he also received his commission. Directly from the Academy, he was selected to attend the Air Force Institute of Technology (AFIT) for a Masters of Science degree in Systems Management. Following graduation from AFIT, he will be assigned to the Air Force Institute of Technology. He loves the place so much that he does not want to leave.

Permanent Address: ████████████████

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13. ABSTRACT (Maximum 200 words)

This follow-on research investigated the educational processes employed by universities to enable their students to comprehend and apply Total Quality principles. The results of this research are intended to be used by Department of Defense institutions of higher education as a current guide to help them adopt practices which will enable their students to comprehend and apply Total Quality in their future assignments.

Using a source list of schools from Quality Progress (Sept. 1995), contact individuals were interviewed at several civilian and military universities across the United States. Investigative questions were developed and asked concerning the specific educational processes of curriculum development, course construction and delivery, and the use of various feedback techniques. The results of the interviews were consolidated, compared, and contrasted to produce a guide of activities that have been attempted by universities trying to impart the principles of Total Quality to their students. By using processes similar to those of the prior research, an overview of changes in the teaching of total quality principles in the past three years was also developed.

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AFIT RESEARCH ASSESSMENT

The purpose of this questionnaire is to determine the potential for current and future applications of AFIT thesis research. **Please return completed questionnaire** to: AIR FORCE INSTITUTE OF TECHNOLOGY/LAC, 2950 P STREET, WRIGHT-PATTERSON AFB OH 45433-7765. Your response is **important.** Thank you.

1. Did this research contribute to a current research project?   a. Yes   b. No

2. Do you believe this research topic is significant enough that it would have been researched (or contracted) by your organization or another agency if AFIT had not researched it?

a. Yes   b. No

3. **Please estimate** what this research would have cost in terms of manpower and dollars if it had been accomplished under contract or if it had been done in-house.

Man Years_____ $_____

4. Whether or not you were able to establish an equivalent value for this research (in Question 3), what is your estimate of its significance?

a. Highly   b. Significant   c. Slightly   d. Of No
   Significant   Significant   Significance

5. Comments (Please feel free to use a separate sheet for more detailed answers and include it with this form):

_____   _____
Name and Grade   Organization

_____   _____
Position or Title   Address