

**STAGES OF CONCERN OF MANAGERS ABOUT THE ADOPTION OF  
SATELLITE SYSTEMS FOR TRAINING THE  
DEFENSE FINANCE AND ACCOUNTING SERVICE**

by

Jacqueline Ann Kern Merz

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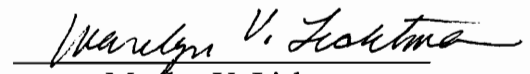
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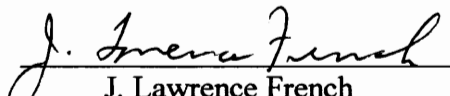
Adult and Continuing Education

APPROVED:

  
Harold W. Stubblefield, Chairman

  
Albert K. Wiswell

  
Marilyn V. Lichtman

  
J. Lawrence French

  
Frederick L. Copeland

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Blacksburg, Virginia

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(ABSTRACT)

The Defense Finance and Accounting Service (DFAS) is changing from traditional training methods to satellite delivery systems. According to the Stages of Concern about the Innovation (SoC), one dimension of the Concerns-Based Adoption Model (CBAM), individuals experience concerns during the process of adopting an innovation. Research supports that identification of concerns and appropriate interventions facilitate innovation adoption. However, little research has been published with respect to use of SoC other than in education since the conceptualization of CBAM in 1973.

The purposes of this study were : 1) identify the Stages of Concern of the civilian managers employed in the five DFAS Centers toward satellite education and training with the use of the SoC Questionnaire (SoCQ) and the Open-Ended Statement of Concern About an Innovation; 2) explore the utility of the SoC to this population; and 3) draw implications from the expressed concerns of the managers to determine appropriate interventions to assist the managers through the change process. The purposes were

accomplished through a census survey with a response rate of 55% (N=370). A modified version of the original SoCQ and the Stages of Concern about the Innovation Open-Ended Statement identified both the managers' SoC and specific concerns.

Eighty-four percent (84%) of the respondents reported no experience with satellite education. SoC profiles typified a positive "nonuser" with highest Stages in 0 (Awareness), 1 (Informational), and 2 (Personal). A peaked Stage 5 in each SoC profile suggested "Collaboration" concerns, as would be anticipated from a population of managers. Chi-square showed no association between highest SoC and Center. Pearson r correlations showed no relationship between highest SoC and years of employment in the federal government, the financial management career field, or the number of employees within the managers' scope of responsibilities. Correlational analysis showed a weak relationship,  $r = .24$ , between highest SoC and number of courses completed by satellite. SoC group profiles by number of courses completed showed similar "nonuser" patterns. Written comments identified competing concerns between training programs and satellite medium. SoC constructs appeared to be operating throughout the findings which supported previous SoC research.

## **DEDICATION**

I dedicate this entire effort to my loving family, my sons Robert and David, and my husband, Ed. My sons offered words of encouragement and pride, taking upon themselves a parental role to help me attain my goal. Ed has been my strength and inspiration for nearly 30 years. Throughout what seems a lifetime of study, he gently offered me unremitting support and drew me pictures of sequential goals during the darkest hours when even the next step appeared intangible. Through his keen vision, he provided insight to things blatantly clear, yet mere shadows to me, and often heard what I was saying when others could not even begin to capture the sounds of my words.

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I also owe a special thanks to two members of the CBAM research team, Dr. Gene Hall from the University of Northern Colorado and Dr. Archie George from the University of Idaho. Both of these individuals provided me support and guidance through phone conversations and written correspondence. They clearly brought to life a better understanding of SoC theory and helped me direct my course of action.

Although a cadre of contributors from DoD helped make this research possible, several individuals are not overshadowed by the crowd. Mr. John Raines, President of the Defense Business Management University, paved the way for this research during my post Master's internship. The contacts I made through John throughout many DoD organizations were immeasurable in getting the study off the ground. A special thanks to Mr. Steve Freeman, Deputy Director for Human Resources, DFAS Headquarters, who sponsored the study and provided the necessary assistance to help ensure a productive outcome. A special thanks to a former DFAS employee, Mr. Terry Hill, and Ms. Angela Brooks, DFAS Training Director, and her assistant, Rosea Hayes, each of whom steered me through information channels and provided assistance in the dissemination and collection of the survey instrument. Joy Martin, formerly Senior Consultant with DFAS and a key member of the team that orchestrated the first Learning Center, shared with me the nuts and bolts of the accomplishments and expectations for the Learning Centers.

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# CHAPTER 1

## INTRODUCTION

In 1993 in the Report of the National Performance Review, Vice President Al Gore challenged federal agencies "to create a government that works better and costs less" (Gore, 1993, p. 2). As a result of this mandate several government agencies have been eliminated, while others are drastically streamlining their workforce, which, in turn, is changing organizational structures and methods of operating. A reduction in the Department of Defense (DoD) budget and peacetime conditions created additional stress in the Defense Finance and Accounting Service (DFAS), an organization within the Department of Defense (DoD) Financial Management Community. The budget reductions resulted in manpower reductions, an attempt to standardize DFAS operations, and a call for more effective and efficient training. Senior management made the decision to use distance learning, computer based training (CBT), and satellite education and training. Satellite education and training, the focus of this study, is a significant change from the traditional classroom and on-the-job-training formats for DFAS.

The DFAS managers are in a position to influence their personnel in adopting this new training method. Managers through attitude and behavior either consciously or unconsciously create a work environment which influences the workforce (Schatz & Schatz, 1986), and their responsibility to motivate the workforce is a common theme in the literature (Bennis & Schein, 1983; Schatz & Schatz, 1986; Vroom, 1964). Concerns

can be exhibited through attitudes and behaviors. The DFAS managers' concerns can have an impact on the workforce toward this educational innovation.

Distance learning is clearly a change from the traditional classroom environment. According to Hall, Wallace, and Dossett (1973), originators of the Concerns-Based Adoption Model (CBAM), change is a developmental growth process. As individuals move through the process of adopting an educational innovation, they naturally experience different stages of concern. Based on their conceptualization of change, individuals can be assisted through the process by identifying their concerns and addressing them with appropriate interventions.

CBAM has three diagnostic dimensions: Levels of Use, Innovation Configuration, and Stages of Concern (Hall & Hord, 1987). Levels of Use of the Innovation addresses the extent to which an innovation is used. Innovation Configuration focuses on the operational forms of the innovation during use. The Stages of Concern (Appendix A) depicts the phases of concern through which an individual progresses during the process of adopting an educational innovation. Individuals move through the process as their concerns are resolved and they gain knowledge of and experience with the innovation. The speed of progress through the stages of adoption will depend on the resolution of concerns, personal experience or involvement with the innovation, and the environmental context (Hall, George, and Rutherford, 1986).

## **Background of the Problem**

In the past five decades the military and other DoD organizations developed finance and accounting systems and procedures to respond to their respective operations. By 1991 DoD established 66 primary financial systems and 161 primary accounting systems which were scattered across approximately 300 locations in the United States. Most of these systems were incompatible with other systems and useful only with parent organizations (Locations Chosen, 1994; Kozaryn, 1995). Therefore, each agency and organization developed several practices and procedures which potentially served similar purposes, but could not be used interchangeably among organizations. Some of the systems were location specific and could not be used throughout the same organization or agency. Efforts began to streamline these duplicated operations in January 1991 when the Defense Finance and Accounting Service (DFAS) was chartered.

In August 1991 the Deputy Secretary of Defense directed DFAS to consolidate the 300 field sites and standardize the finance and accounting systems (Locations Chosen, 1994). After several years of management initiatives, the plan for the DFAS reorganization resulted in reducing the 300 field sites to twenty-six -- five original Centers and twenty-one operating locations (OPLOCs). The Centers provide the core operations for DoD financial management and accounting. Each of the original five Centers was retained to continue operations, employs approximately 1,000 to 3,200 civilian and uniformed personnel (military), and serves one of five Defense organizations: Air Force,

Army, Marine Corps, Navy, and Defense Agencies. By July 30, 1995, thirteen of the twenty-one OPLOCs had opened (Fowler, 1995). Three additional OPLOCs were operating within the following year. Each OPLOC is subordinate to one of the five Centers and currently employs approximately 150 to 500 personnel.

Training requirements will change as jobs are revised in concert with the consolidation of the DFAS infrastructure and the consolidation and standardization of the finance and accounting systems. More than the previous traditional classroom and on-the-job-training methods are required to meet the demands of educating both a seasoned workforce in revised job functions and newly hired personnel in competency areas. Classroom instruction incurs travel expense and additional time away from the job. Distance learning by CBT and satellite systems were identified as effective and efficient methods for this large scale training initiative. Distance learning could offer standardized training, avoid travel costs, and reduce the time away from the job.

In July, 1993, DFAS opened its first Learning Resource Center in Indianapolis. This Center served as a pilot study. The mission of the Center is to test personnel for academic ability levels through diagnostic tools, offer counselling services to generate career development paths, and provide adult basic education through computer based tutorials. The Center offers a variety of educational materials and supporting technology, including self-paced, computer based training by software packages and CD-ROM through a local area network (LAN) of 32 workstations, and satellite services for the Public Broadcasting Station.



An evaluation of the pilot program after a twelve month period of operation showed the Learning Center enhanced customer service, provided for the physically challenged, and provided continuity of learning through standardized training (Defense Finance and Accounting Service, 1995). A mean gain of 9% between pre and posttest scores in language and math suggested positive learning outcomes. One hundred and eighty-four employees participated in courses delivered by satellite. DFAS realized monetary savings by a decrease in time away from work, travel cost avoidance, and reduction in instructional development and delivery costs. Estimated financial savings for the first year of operation were \$338,934. Based on the success of this pilot program, similar Learning Centers were established in Columbus, Cleveland, and Denver by mid-March 1996 and plans were underway for Kansas City's Learning Center. This model will be used for developing smaller scale Learning Centers for the OPLOCs.

To assist in meeting the demands of cost effective and efficient training for a large scale training initiative, a center in Southbridge, Massachusetts is proposed to serve as a hub for the DoD Financial Management Education and Training Program (Department of Defense, 1994) and provide state-of-the-art training technology and delivery systems for the financial management workforce of 88,000 personnel. This community includes approximately 23,000 DFAS employees.

In support of these efforts I submitted a report to the Directorate for Management Improvement, Office of the Secretary of Defense, Comptroller, in September 1994, during a post Master's internship with DoD. The report includes recommendations and cost

parameters for computer based training (CBT) with local and wide area networks (LAN and WAN) and landline/satellite education and training for the financial management community (Merz, 1994). These educational technologies are new methods of training for DFAS. Other than PictureTel, a landline system used by DFAS for videoteleconferencing and occasionally education programs, many DFAS employees have not experienced training through distance learning technology. However, with the exception of Kansas City, by mid-March 1996 all Centers had the capacity to receive courses via satellite by a one-way video, two-way audio system. Kansas City's system would not be established until later in the year.

From an administrative perspective, the DFAS managers have a leadership role during this change process. Leadership plays a pivotal role when "habitual ways of doing things no longer work, or when a dramatic change in the environment requires new responses" (Schein, 1988, p. 36). Maney's study (1994) of the adoption of multimedia technology in 38 public schools supports the importance of the role of management in the change process. The findings of Maney's research showed school principals played a significant role in whether their respective schools adopted multimedia teaching and the rate of adoption. The public high schools that adopted multimedia technology were more likely to have a principal that adopted the educational technology than schools that did not. Additionally, the low adoption rate (24%) of educational technology suggested a resistance to the innovation. Findings from the four year Rand Study (Berman & McLaughlin 1978), which investigated federally funded educational innovations, also

demonstrated that leadership was a critical factor for effective implementation and continuation of innovations in schools. Continuation of innovations was more dependent on an active, supportive school principal than the project director. The study also indicated a positive relationship between perceived principal support and achievement of project goals.

The importance of motivation to change from traditional methods of instruction to distance learning is identified in higher education. Dillon, Hengst, and Zoller (1991) reported faculty who teach on the Oklahoma Televised Instructional System, a network which links ten educational institutions (community colleges, four-year and graduate colleges and research universities), preferred not to teach by the two-way audio and one-way video interactive system. Analysis of the data suggested there was a lack of incentive through the rewards system to teach by this medium.

Lack of knowledge about, and use of, educational technology are cited as indicators that prolong the adoption of the technology. Dillon, et al. (1991) reported the faculty who taught on the Oklahoma Televised Instructional System used the same teaching strategies for this distance education system as in the traditional classroom. Although the research findings suggested that the teaching methods used were based on the learning required for the course, none of the faculty in the study had training in methods for teaching televised courses or course design. Al-Musned's (1989/1990) research findings regarding computer use of college faculty indicated that faculty who did

not use computers had more negative attitudes about computers than those who used them.

Stages of Concern research identifies several factors that influence an individual's concerns about adopting an educational innovation, namely, the innovation, environmental context, and knowledge of and experience with the innovation. The research of Hall and others (Hall, George, & Rutherford, 1986) verifies that individuals move through a developmental pattern of Stages of Concern during the process of adopting innovations. Identification of the "stage" concern assists in determining the appropriate interventions to facilitate the process toward adoption.

### **Statement of the Problem**

DFAS' use of satellite education and training is a change from its traditional classroom and on-the-job-training formats. Due to reorganization, job redesign, and employee population of 23,000, DFAS will conduct a large scale training effort. Based on the findings of Hall and other researchers at the Texas Research and Development Center for Teacher Education at the University of Texas at Austin (George, 1977; Hall, 1979; Hall & George, 1979; Hall, et al., 1986), the Stages of Concern About the Innovation (Appendix A) would suggest that the DFAS managers will experience concerns about satellite education and training. These stages can range from concerns "unrelated" to the innovation to concerns about "self" (personal knowledge and adequacy), "task" concerns

(management tasks and processes), or "impact" concerns (impact on others, coordinating with others, and exploring benefits). In the change from on-the-job-training and the traditional classroom format, the concerns of the DFAS managers about satellite programming have not been identified.

The reason to consider the managers' concerns was apparent from two aspects. First, studies have identified a range of problems involved in adopting innovations and factors that assist in the acceptance of change. Research shows that identifying the concerns of those involved in the change process and providing the appropriate interventions can minimize some of these problems. If concerns are not identified and addressed, there is a greater potential for problems to occur. Secondly, as effective managers control the "critical" psychological aspects of the work environment (Litwin & Stringer 1968) and influence their workforce through attitude and behavior, they play a vital role in creating an environment conducive to change. Therefore, identifying the managers' concerns and appropriately addressing them through education and training or administrative interventions would help ensure a more accepting environment for implementing and institutionalizing satellite education and training throughout DFAS.

"Environmental factors" is one of SoC's hypothesized variables that can influence concerns and affect the progression through the change process. The environment of each of the five DFAS Centers differs by both geographic location and the DoD organization it serves: Cleveland (Navy); Columbus (Defense Agencies); Denver (Air Force); Kansas City (Marine Corps); and Indianapolis (Army). Each of the uniformed services has its

own unique mission and culture which influences the respective environment. Therefore, there was a potential that concerns may vary among the Centers. Different concerns require different interventions.

Hall, George, and Rutherford (1986, p. 52) report their research has shown "no outstanding relationships between standard demographic variables [e.g. age, sex, years of teaching experience] and concerns data". However, the findings from the Rand Study (Berman & McLaughlin, 1978) showed a negative relationship between the number of years of teaching and the achievement of project goals. Teachers with many years of teaching experience were less likely to change personal practices. Therefore, as the population of this study also differed from those in schools, the relationship between standard demographic characteristics and stage concerns of the DFAS managers could not be assumed prior to investigation. Additionally, this study included all levels of management in the DFAS Centers. Managerial concerns were expected to differ by the managers' scope of responsibility. Different concerns require different interventions.

### **Purpose of the Study**

The purposes of this study were threefold. The first purpose was to identify the Stages of Concern of the managers employed in the five DFAS Centers toward satellite education and training with the use of the Stages of Concern Questionnaire and the Open-Ended Statement of Concern About an Innovation. The second purpose of this study was

to explore the utility of the Stages of Concern About the Innovation (Appendix A) to this population of DFAS civilian managers. The third purpose was to draw implications from the expressed concerns of the managers to determine the appropriate interventions to assist the managers through the change process.

## **Research Questions**

Several research questions guided the collection of the data for this study.

1. What are the Stages of Concern of the DFAS managers toward satellite education/training?
2. Are the managers' predominant Stages of Concern about satellite education/training independent of Center site, each of which serves one of five DoD organizations: (Army, Air Force, Navy, Marine Corps, and Defense Agencies)?
3. Is there a relationship between the managers' predominant Stages of Concern about satellite education/training and the number of employees within the scope of the managers' responsibilities?
4. Is there a relationship between the managers' predominant Stages of Concern about satellite education/training and years of employment in the federal government?
5. Is there a relationship between the managers' predominant Stages of Concern about satellite education/training and years of employment in the financial management career field?

6. Is there a relationship between the managers' predominant Stages of Concern about satellite education/training and the number of courses completed by satellite?

### **Significance of the Study**

Since the conceptualization of CBAM in 1973 and the development of the Stages of Concern Questionnaire (SoCQ) in 1974, little research has been published in respect to use of the model other than for those in education. The study population of civilian managers in DFAS had the potential to broaden the application of the Stages of Concern to a context that differed from previous studies. The literature identifies only two studies (Barucky, 1984; Bernier, 1990) that used the SoC with DoD populations. Findings from Barucky's (1984) research of the concerns of Air Force officers, cadets, and trainees about professional military education demonstrated the applicability of concerns theory to leadership training in the Air Force. His findings showed a shift in concerns across stages with experience, that is, those with more leadership experience expressed higher levels of concerns in later stages than those less experienced. Bernier (1990) used the SoC to assess the concerns of commissioned officers in the Marine Corps regarding the Marine Corps professional military education program and provide recommendations. The population of this study differed from that of Barucky (1984) and Bernier (1990) by occupational workgroup in financial management and expressed concerns about one innovation from five different DoD organizational environments.



The findings from the study identified where the managers were in the change process and the specific issues about satellite education/training as expressed by the managers from their responses to the open-ended statement. This information provided the foundation from which to develop relevant interventions to address current concerns, and, as the SoC hypothesizes a predictable process, anticipated future concerns. The identification of concerns coupled with the appropriate interventions can save valuable time and resources during the implementation and institutionalization phases of this large scale training effort and offer the potential for a smooth transition and positive learning outcomes through satellite education and training for DFAS.

### **Limitations**

The DFAS workforce was experiencing many significant changes in the organization from re-engineering operations to restructuring the workforce. Therefore, although the intent of this study was to identify the DFAS managers' Stages of Concern about satellite education and training, it was recognized that it may have been difficult to identify only those concerns related to this distance learning innovation. The concerns regarding satellite education and training may have been influenced by the many changes the federal government was experiencing, namely, job insecurity and job reanalysis. Additionally, approximately 8% of the total population of the DFAS managers employed

in the five DFAS Centers were noncivilian (uniformed service) personnel. This population was not included in the study.

## **Definitions and Acronyms**

**CBT** - computer based training; instruction by computer software, compact disk-read only memory (CD-ROM), or networking systems, e.g. internet.

**Concern** - "The composite representation of feelings, preoccupation, thought, and consideration given to a particular issue or task...the mental activity composed of questioning, analyzing, and re-analyzing, considering alternative actions and reactions, and anticipating consequences...an aroused state of personal feelings and thought about a demand as it is perceived" (Hall, George, & Rutherford, 1986, p. 5).

**Concerns-Based Adoption Model** - A conceptualization of the dynamics of concerns experienced by individuals as they progress toward the adoption of an innovation. The three key elements of CBAM are: Stages of Concern (SoC), Levels of Use (LoU), and Innovation Configuration (IC). The seven Stages of Concern About the Innovation identify the phases of progressional movement toward adoption as an individual gains knowledge and use of an innovation. Levels of Use "focuses on knowledge, skill, and behavioral aspects of the individual's involvement with a change" (Hall, et. al., 1986, p. 4). Innovation Configuration refers to the operational form the innovation "takes on during actual use" (Hall & Loucks, 1981, p. 47). The process model involves dynamic,

collaborative linkages between a user system and resource system which are used to assess the adopter's concerns and develop appropriate interventions.

**DFAS** - Defense Finance and Accounting Service; a community in DoD which employs approximately 23,000 civilian and military personnel who provide services of accounting, pay, and disbursements to federal employees and vendors.

**DFAS Center** - one of five major operating locations within the Defense Finance and Accounting Service. Each Center employs approximately 1,000 to 3,200 civilian and military personnel.

**Distance Learning** - a delivery system other than traditional student/instructor classroom format, i.e. computer based or videoteletraining systems.

**Financial Management Community** - a community of approximately 88,000 federal employees tasked with monetary concerns for government operations.

**Innovation** - "any process or product that is new to a potential user" (Hall, 1979, p. 203).

**Managers** - employees who are responsible for the operations of the work units, evaluate personnel through written performance appraisals, and are stationed in one of the 5 DFAS Centers. This population includes all levels of management, i.e. entry level to senior managers.

**OPLOCs** - operating locations; each work site employs approximately 150 to 500 personnel and reports to one of the 5 DFAS Centers.

**PictureTel** - a landline transmitted audio/video teleconferencing system used by DFAS primarily for administrative conferencing and meetings.

**Planned Change/Planned Innovation** - "a change or innovation which comes about through a deliberate process which is intended to make both acceptance by and benefit to the people who are changed more likely" (Havelock, 1973, p. 4).

**Satellite Education and Training** - instructional programs delivered by satellite transmission with audio and video components which broadcast from a hub or uplink site to a downlink or receive site.

## **CHAPTER 2**

### **LITERATURE REVIEW**

This chapter presents a review of the literature on planned change and the diffusion and adoption of innovations. Researchers developed numerous theories and models in planned change which evolved from research ranging from third world urban and agricultural environments to organizations in the western world. Researchers in the fields of agriculture, geography, education, management, and the general field of social science studied planned change. However, regardless of the discipline, the psychosocial, human factors involved in the process of changing is a common aspect in the range of planned change theories. This chapter reviews the literature of planned change relevant to the study and the research that influenced the conceptualization and development of the Concerns-Based Adoption Model.

#### **Change Theories**

Kurt Lewin (1951), Rogers and Shoemaker (1971), Havelock (1971; 1973), and Lippitt, Watson, and Westley (1958) are recognized theorists in the field of planned change. Their research has laid the foundations for numerous theories and models in the planned change process and provides an appropriate foundation for this study.

## **Change Process**

The focus of many planned change theories is on the interdependence and interrelationship of the psychosocial factors involved during change. Kurt Lewin (1951), who is cited throughout the literature of change (Havelock, 1971; Lippitt, Watson, & Westley, 1958; Mink, Esterhuysen, Mink, & Owen, 1993; Redding & Catalanello, 1994), theorized the interdependence and interrelationship between cognition, perception, and values of the holistic individual through "field theory" and the "life space" of individuals and their psychological environments. Field theory describes tension states of system(s) relative to surrounding systems. Tensions arise out of the driving and restraining forces within the field that develop from the relationship between the social and psychological obstacles within the life space.

Planned change requires changing the force field between the present level of equilibrium and the desired level of equilibrium. This change requires individuals or groups to break from their established customs or traditions and social habits, i.e. standards that carry social value. Changing group rather than individual standards facilitates the change process. Attempting to break individuals away from a valued group standard increases potential resistance to change. The greater the value of a standard, the greater the resistance to break away. However, resistance of individuals can be reduced if the group's values or standards change (Lewin, 1951).

Lewin (1951, pp. 28-36) offers a three stage model for successful change: unfreezing the present state -- changing or moving -- and freezing group standards. The

process of unfreezing and moving is a quasi-equilibrium state. It is movement from constancy, i. e. "...the same conditions (that) lead to the same effect" (Lewin, 1951, p. 200), which requires a change in the opposing forces in the force field. "Only by relating the actual degree of constancy to the strength of forces toward or away from the present state of affairs can one speak of degrees of resistance or 'stability' of group life in any given respect." (p. 200). The decision to change is the link between the motivation to change and action. Decisions have a "freezing effect". How the decision to change is made will affect how and to what extent the change or innovation is adopted.

### **Diffusion and Utilization**

Lewin (1951) provided a theoretical concept of the change process. Diffusion researchers present a different perspective on change. Rogers and Shoemaker (1971) and Rogers (1983) identify adopter characteristics and focus on the decision phase of an individual or system to adopt or reject an innovation. If the decision is made to adopt the innovation, they, along with Havelock (1971 and 1973), assume the implementation of the innovation.

Rogers and Shoemaker (1971) address the spectrum of change from the origin of the innovation to the individual of a social system that adopts or rejects the innovation through the process of diffusion. Diffusion is "the process by which (1) an *innovation* (2) is *communicated* through certain *channels* (3) *over time* (4) among the members of a *social system*" (Rogers, 1983, p. 10). Although they recognized that the decision to adopt

or reject may be made by individual members (*optional decisions*), consensus of the social system (*collective decisions*), or by coercion (*authority*) (Rogers & Shoemaker, 1971, p. 40), they identified the "shortcomings of previous diffusion research" in which the individual was treated as the "unit of analysis, rather than dependency on relational analysis" (p. 96). As such, their research referenced the individual to a social system in a social structure.

The social system influences members through norms and behavior (Rogers and Shoemaker, 1971). Systems with "modern norms" are more change oriented than those systems which embrace traditional norms. Attitude and behavior is influenced by the opinion leadership, and change agents influence the direction of the innovation decision. Likewise, the social structure and statuses, e.g. positional structures in hierarchial systems, could hinder or facilitate the rate of adopting an innovation throughout the system.

With the recognition of differences in individuals and innovations, Rogers and Shoemaker (1971) conceptualized a 4 Stage Innovation-Decision Process Model made by optional (individual) decisions. They hypothesized that the stage order may differ by individual and innovation. The stages of the initial model were: 1) knowledge - exposure and gains in understanding; 2) persuasion - attitudinal position; 3) decision - adopt or reject; and 4) confirmation - reinforcement or reversal of previous decision. Rogers (1983) later added an implementation stage to the model. During this stage "re-invention" may occur, i.e. modification of the innovation by the user.



A primary focus of the model is the rate of adoption, which is the time lapse between the introduction of the innovation through the "innovation-decision process" to its widespread adoption (Rogers & Shoemaker, 1971; Rogers 1983). This is determined by the type of innovation decision (optional, collective, or authority), the nature of the system and its communication channels, the change agent, and the individual's perceived attributes of the innovation. These attributes are: relative advantage, compatibility, complexity, trialability, and observability. Relative advantage is the perception that the innovation is better than what preceded it. Compatibility is the perception that the change is consistent with values, experiences, and needs of the users. Complexity is the perceived difficulty of understanding and use of the innovation. Trialability is the amount of experimentation prior to full implementation of the innovation. Observability is the degree to which the results of the innovation can be seen. With the exception of "complexity", the attributes are positively related to the rate of adoption (Rogers & Shoemaker, 1971, pp. 137-157).

Rogers and Shoemaker (1971) categorized adopters (innovators, early adopters, early majority, late majority, and laggards) by their innovativeness. Rogers (1983) defines innovativeness as "the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a system" (p. 242). Based on the findings of numerous studies they developed generalizations from socioeconomic, personality, and communication behavior characteristics of earlier adopters. With respect to the variables of this study there was no consistent relationship for the variable age

between earlier and late adopters. Earlier adopters had more years of education, had a greater degree of "connectedness" to other units, more knowledge of the innovation, and higher social status (occupational status) than later adopters (Rogers, 1983, pp. 251-259).

Rogers and Shoemaker (1971) express concern about the lack of empirical publications by educational diffusion researchers in respect to both "...understanding the diffusion of innovation or to a theory of social change" (pp. 57-58). They criticized educational research for focusing on innovativeness and providing little regard to consequences of educational innovations in the public schools. "As a result, new education ideas must be adopted largely on faith, rather than on a more rational basis in which expected consequences are considered" (p. 321).

Havelock (1971) continued the efforts in understanding the diffusion and utilization of knowledge. Although Havelock recognized the significance of Rogers' research, he identified limitations. Rogers restricted his investigation to empirical research findings, directed findings to social scientists, and confined his study to the diffusion of products and practices. Rogers excluded the psychology factors of influence, attitude, and behavior, and the application of findings to groups. From this perspective Havelock reviewed the literature and models from various disciplines to develop a model that would pertain to the process of dissemination and utilization as seen in practice to serve as a guide for researchers, practitioners, and policy makers.

Havelock synthesized models of Diffusion and Utilization into a communication process by which knowledge flowed through interactive linkages between a "resource

system" and "user system". Within these systems are knowledge levels: interpsychic that leads to behavior, intrapsychic, interpersonal, social system, and intersystem. Although many barriers can hinder the flow of knowledge, e.g. roles, status, attitudes and structures, "value differences probably constitute the major barriers to inter-system knowledge linkage" (Havelock, 1971, chap. 2, p. 33).

From the literature Havelock categorized the three primary viewpoints of Research, Development, and Diffusion (RD&D), Social Interaction (S-I), and Problem Solver (P-S) and tied them to a linkage process of communication between the user system and the resource system. From the RD&D Perspective the user population can be influenced provided basic and applied research, development and testing, and "production" and "packaging" precede the dissemination process. This theory assumes a high initial investment, rationally sequenced activities, large scale planning, division of labor, and a passive acceptance. The S-I Perspective stresses the significance of networks and relationships (identity and loyalty), power and influence, and structures in the social system. The P-S Perspective is a process model that identifies user needs and solutions until the problem is adequately solved. The user is an active participant in this model which recognizes that "self initiated change has the best motivational climate for lasting change" (Havelock, 1971, chap. 11, p. 13).

## **Planned Change in Organizational Context**

An approach to change in organizations that draws from the problem-solver model is Organizational Development (OD). The focus of OD is on the nature and dynamics of the group rather than the individual to help establish functional subgroups and interdependent groups (Hall & Hord, 1987). Organizational Development strategies are humanistic approaches with goals that lead toward a "trusting" organization through collaborative and interpersonal interventions to assist the people in organizations throughout change (Hersey & Blanchard, 1977, pp. 302-303). The efforts of OD concentrate on assisting organizations to adapt to current or future environments (Porras & Silvers, 1991).

Planned change is designed to eliminate fear and contribute to organizational growth through identified priorities and alternatives to accomplish goals. Throughout the literature change is depicted as either an alteration in current conditions or processes, or a new idea or approach which is termed innovation. The term "innovation" is used in several different contexts. In its broadest use in the literature, an innovation is a "process starting with recognition of a potential demand for, and technical feasibility of, an item and ending with its widespread utilization" (Zaltman, Duncan, & Holbek 1973, pp. 7-8). With respect to process, the term "innovation" may be used synonymously with invention to depict creativity, or it may describe the cognitive and behavioral aspects of adopting an innovation. Additionally, the term "innovation" may describe the essence of the novelty of

an " idea, practice, or material artifact that has been invented or that is regarded as novel independent of its adoption or nonadoption" (Zaltman, et al., 1973). The distinguishing characteristic of an innovation is the novelty or newness of the innovation as perceived by the social unit through which the innovation will be diffused.

### **Organizational Dynamics on Innovation**

Although specific characteristics of innovations impact adoption or resistance to change, the climate and culture of an organization can also influence the adoption process. Therefore, the context in which an innovation is introduced and implemented is a significant factor to the success of planned change. However, culture and climate are two distinctly different constructs. According to Schein (1988, pp. 29-30), organizational culture is:

*a pattern of basic assumptions that a given group has invented, discovered or developed in learning to cope with its problems of external adaptation and internal integration, and have worked well enough to be consider valid, and therefore, to be taught to new members as a correct way to perceive, think and feel in relation to those problems.*

Culture, therefore, is organizational identity by which an organization thinks and operates. In preparing for change, "unfreezing" interventions may be indicated if attitudes and behaviors are entrenched in traditions and norms (Beckhard & Harris, 1978).

Mohrman et al. (1989) identify culture as one of the three central, layered elements (culture, assumptions, and psyches) "below the surface of an organization" that impact organizational change. In their model, Barriers to Success of organizational change, Mohrman et al. (1989) suggest that although culture is the easiest of the three layers to manage, culture often directs behavior in the opposite direction from that which is requested by management. However, in order to understand culture, one must understand the grounded ideologies which both drive the behavior of the organization and are founded on underlying assumptions (the second core layer). Assumptions are the beliefs that are taken for granted. Beliefs may be based more on habit than choice. The third depth of the model, the psyches layer is concerned with "...what people want, fear, resist, support and defend" (p. 210) and is the underpinning of success or failure of decisions.

Organizational culture evolves from the history of the organization and is communicated through symbols, language, and practices (Trice, 1993). These characteristics are readily identified throughout the uniformed services in DoD. The Army, Air Force, Navy, and Marine Corps are unique in numerous aspects from uniforms and emblems to slogans, organizational missions, and methods of operating.

Organizational climate is the psychological environment composed of attitudes and behaviors of individuals (Trice, 1993) which can influence change efforts. Findings from the Rand Study (Berman & McLaughlin, 1978, pp. 30-31) showed a correlation between organizational climate and the implementation and continuation of change in educational settings. The factors that "powerfully" affected the implementation and continuation of

projects (educational innovations) were: good working relationships among teachers, a principal who actively supported the project, and effective project directors.

Environments with high morale, those in which teachers participated in decision making and problem solving, and had good working relationships, "strongly correlated" with the continuation of projects. The greater the teachers' perception of principal support, the higher the percentage of achieved project goals. Effective project directors enhanced the implementation phase, but provided no significant effects on project continuation.

### **Organizational Change**

Redding & Catalanello (1994) cite Lewin's three stage model with respect to successful organizational change. The frozen stage depicts traditional functions, cultural norms, and systems that have been unaltered and unquestionably operating within an organization. This frozen stage must be broken when the organization is challenged to modify, abort, or develop new ways of operating. The changing stage occurs when organizations are challenged to modify or develop new ways of operating. This is a transitional period in which questions arise about the appropriateness or purposes of previously implemented procedures, policies, or systems within the organization. Once the new structures and processes are in place, the organization moves into the refreezing state. During this phase the changes are incorporated and the organization ventures into a steady state or "new equilibrium".

## **Change in Education**

Lindquist (1978) focused on the planned change of teaching, curriculum and evaluation in American colleges. His Strategies for Change are based on four theoretical frameworks, three of which emerge from Havelock's (1971) models. These strategies are: Rational Planning (Havelock's Research, Development and Diffusion model), Communication of Innovations (Havelock's Social Interaction), and Havelock's Human Problem Solving. Lindquist introduces a fourth strategy, the Political Approach, which is based on influential coalitions that build confidence that action will be taken. In this approach the supportive gatekeeper is the key player. However, Lindquist notes "often, it is more effective to seek to reduce resistance to change by human relations strategies than to try to overwhelm that resistance by force" ( p. 9). Like others, Lindquist (1978, p. 240) provides underlying factors required to introduce the change: "(1) interpersonal and informational Linkage; (2) active Openness; (3) initiating, guiding, involving and influential Leadership; (4) Ownership; and, (5) material and psychic Rewards".

## **Change Strategies**

Chin and Benne (1985, pp. 22-45) offer three strategies to address the problems of resistance, conflict, and anxieties involved in the planned change. These strategies are: empirical rational, normative-re-educative, and power-coercive. The underlying assumption of the empirical rational strategy is that individuals are rational and will change if the change is "rationally justified". Approaches include: basic research and educating



the public, applied research as seen in land-grant universities and the diffusion of knowledge through linkage systems, and addressing the problems of putting knowledge and change into practice due to improper selection of personnel.

The normative-re-educative strategy addresses man as an individual and social being whose cognitive orientations and perceptions are guided by personal norms, habits and values, and those of his culture. These strategies involve individual participation in one's re-education, approaches to enhance problem solving abilities, methods to promote personal growth and development, and interventions between a change agent and client system. Experience-based learning is highlighted. Lewin, Benne, and Lippitt are noted contributors in the development of normative-re-educative strategies, as were The National Training Laboratories in 1947, where staff and students were both the researchers and subjects to learn about interpersonal and group behavior.

Power-coercive approaches to change address the political and economic support and sanctions involved in the attainment of or opposition to a goal. One group of strategies in this approach includes those of a nonviolent nature, such as negotiations, or demonstrations, strikes, or boycotts to weaken the opposition. Another strategy is through political institutions that legitimize change and make traditional practices unacceptable through laws and policies. In this respect, the normative-re-educative strategy to inform the public of the regulations and any new knowledge or behavior requirements is essential to achieve the desired change.

From a behavioral science perspective, Lippitt, Watson, and Westley (1958) expand Lewin's model of planned change to include the relationship between the change agent and the client. Their orientation of planned change is through the actions of selected change agents who emphasize the "...change process as improvement in the relationship of the client system to its environment" (p. 64). From this perspective, it is the responsibility of the client system to understand and cope with the environment. Lippitt, et al. (1958, pp. 129-143) expand Lewin's three stage model to seven phases based on their study of change agents. "Phase 1, The Development of a Need for Change", parallels Lewin's unfreezing stage. "Phase 2, The Establishment of a Change Relationship" is the development of the working relationship between the client system and change agent. "Phase 3, Working Toward Change" is the changing process or Lewin's moving stage. This phase is summarized and subdivides into: Phase 3, diagnosing the problem of the client system; Phase 4, establishing goals and actions; and Phase 5, the actual change efforts. "Phase 6, The Generalization and Stabilization of Change", identifies with Lewin's freezing stage. "Phase 7, Achieving a Terminal Relationship", is a cessation of the relationship between the change agent and the client system.

Havelock (1973) provides another model in planned change which addresses the activities of change agents in education. The model is founded on the findings of more than 1,000 studies of innovation and utilization in education and other disciplines. With a focus on the individual adopter, Havelock describes six functions of the change agent termed the Stages of Planned Change. The first four stages prepare for the change.

"Stage I: Relationship", involves establishing a relationship with the client. "Stage II: Diagnosis" involves assessment and problem definition. "Stage III: Acquiring Relevant Resources" addresses the acquisition of human and material resources required for the change. "Stage IV: Choosing the Solution", involves generating the best solution to address the problem and one congruent with the client system. "Stage V: Gaining Acceptance", is the period of instillation of the innovation. In this stage the change agent concentrates activities on the Adoption Process of the individual: "awareness, interest, evaluation, trial, adoption, and integration" (Havelock, 1973, pp. 113-116), gaining group acceptance of the innovations, effective communication strategies, and maintaining program flexibility. "Stage IV: Stabilizing the Innovation and Generating Self-Renewal", involves methods to insure continuance of the innovation, encourage systems to develop internal change agents, and disengaging from the client system.

Change through education is the theme throughout the literature of planned change. Change in educational institutions became the focus of study at the Research and Development Center for Teacher Education at the University of Texas, Austin. In the 1960s Frances Fuller and colleagues began research in concerns-based theory with the identification of concerns of students in education courses. In the 1970s Gene Hall and other researchers investigated the concerns of teachers and school administrators about educational innovations. Concerns-based theory evolved and developed from the findings of these researchers.

## **Concerns Theory**

### **Concerns of Teachers**

The research of Frances Fuller (1969) began by investigating the relevancy of undergraduate teacher preparation courses as perceived by the students. The research was driven by the fact that there was high attrition in education courses and the concern that education courses were not addressing the immediate needs of the students. Fuller conducted a pilot study to explore the attitudes of education students about courses. The findings from the hour long interviews of students (N=100) showed that the young, undergraduates with no teaching experience (N=97) spoke negatively about an introductory course. The middle aged students had a substantial amount of teaching or similar experience (N=3) and were enthusiastic about the course. Questions that developed from the findings focused on the readiness of the inexperienced undergraduate teacher to benefit from the traditional program, student concerns, and identification of student interests to help provide appropriate course content and experiences. This pilot study was the impetus for many years of research.

The purpose of Fuller's early studies was to investigate the concerns of prospective teachers through research and the literature and to determine if teacher concerns could be conceptualized. Fuller's (1969) first study was conducted through counseling sessions by a counseling psychologist. The sessions were substituted for a semester seminar and were held weekly for two hours with six student teachers. The sessions were recorded on tape.

The following semester the procedure was repeated with eight student teachers and two counseling psychologists. The procedure was repeated again during a third semester with seven students. The statements made by the two groups from the first and second semester were categorized by topic. Statements made by the third group were not categorized. Findings from the two groups of categorized responses showed differences in the frequencies of responses between the earlier and later weeks of the semester. The pattern was similar for the combined group and separate groups. Based on the frequency of topics and the clinical impression from the taped recordings, the three separate groups of student teachers in early, middle, and late semester sessions showed bipolar categories of concerns about "self" and "pupils". Students expressed "self" concerns during most of the semester but expressed more pupil concerns in the late sessions of student teaching. "Self" concerns concentrated on personal adequacy of controlling a class, knowledge of subject matter, position in the "...power structure of the school and understanding expectations of supervisors, principals, and parents" (Fuller, 1969, p. 211). As the student teachers gained experience in teaching, their concern about self developed into concerns of experienced teachers about pupils and focused on the learning and progress of the students.

Fuller (1969) conducted a second study in which student teachers (N=29) were surveyed approximately every two weeks during a semester. Students were asked to write their answer to the question, "what you are concerned about now?". Analysis of the findings showed all respondents had self adequacy concerns and/or concerns about class

control. No respondent was concerned primarily about pupil learning. This was consistent with the two concern categories, concerns about self and concerns about pupils, from her previous study.

Although Fuller (1969) noted some differences between her findings and those reported by other investigators in earlier studies, Fuller's review of the literature supported her findings that early concerns were "self" concerns and later concerns were about pupils. Pre-service and beginning in-service teachers had what Fuller classified as self concerns. Early student teaching anxiety was due to student fears about the inability to gain control of a class and the emotional support of students. Concerns of experienced teachers more often concentrated on pupil progress. Fuller concluded "the evidence seems to support a developmental conceptualization of teacher concerns" (p. 218). She posited the three developmental phases of concern: (a) "Pre-teaching Phase: Non-Concern"; (b) "Early Teaching Phase: Concern with Self"; and (c) "Late Concerns: Concern with Pupils" (pp. 218-221).

Fuller and others (Fuller & Parsons, 1972; Parsons & Fuller, 1974; Fuller, Parsons, & Watkins, 1974) continued research on teacher concerns and concentrated efforts on methods to measure concerns. The first instrument was the Teacher Concerns Statement (TCS). Over the course of three years, more than 1000 preservice and inservice teachers provided responses to the TCS, "When you think about your teaching, what are you concerned about?". Although the scoring was problematic, Fuller and Parsons (1974) reported that three categories of teacher concerns emerged based on the responses of

preservice (N=1028) and inservice (N=265) teachers. The findings showed the preservice teachers were concerned about self and task. Concerns of the inservice teachers were classified as "self-benefit--pupil-benefit" and "Teaching-Task" (p. 7).

Further pursuits of a reliable and valid instrument resulted in the Teachers Concerns Checklist (TCCL). The analysis of responses from the second version of the TCCL (TCCL-B) showed three teacher concern categories identified as "Self-Concern, Situational Concern, and Student-Needs (Impact) Concern". Fuller and Parsons (1974) omitted the situation category from their "model of intrapersonal change" (p. 12) and revised their original model of concerns about "self" and pupils to concerns about "self, task, and impact on pupils" (p. 12).

Research efforts continued in measurement development. Fuller and Parsons (1974, p. 12) noted:

Our experience in the search for truth about concerns of teachers, a search that has been pursued for a decade, have by necessity, involved the search for a viable research tool for measuring concerns. This search is reminiscent of the rat lost in a complex maze. By all rights our efforts should have been extinguished long ago in view of the measurement difficulties encountered...

### **Concerns-Based Adoption Model**

In 1973 Hall, Wallace, and Dossett expanded the concerns based theory of Fuller's (1969) research regarding teacher concerns about undergraduate courses and teaching to the concern that innovations in education in the 1960s were not used or failed to be adopted. Influenced by Fuller's research, the literature on change in education and change theories (e.g. Havelock, 1971; Rogers & Shoemaker, 1971), and personal experiences about the adoption of innovations in schools and industry (Hall, n.d.), Hall et al. (1973) conceptualized a process of concerns that individuals experience when adopting educational innovations. Based on the hypothesis that adoption is a process of developmental stages of a user (in educational settings), these researchers hypothesized that Fuller's findings that concerns were a sequential, developmental process, could be generalized to the process of adopting an innovation. They further hypothesized that "concerns" could be assessed, and based on the identification of concerns, actions or interventions could be developed to assist the individual through the adoption process "toward a more effective use of the innovation" (Hall, et al., 1973, p. 6). This conceptualization is the Concerns Based Adoption Model (CBAM).

The Concerns-Based Adoption Model (CBAM) draws from Havelock's (1971) categories of change, i.e. RD&D Perspective and P-S Perspective, and the concepts of linkage. The model links a user system and the innovation with a resource system. The user system is composed of the adopters. The resource system is an institution or agency that assists users in adopting an innovation to the extent that the user becomes



independent of the resource system. CBAM also refers to a conceptual "collaborative system", shared activities of the user and resource systems that facilitate adoption. A facilitator or change agent is the linkage between the user and resource systems who assists in the adoption of the innovation by creating a collaborative system. The change agent assists the users in resolving concerns about the innovation and progressing through hierarchical levels of using the innovation to its adoption.

CBAM assumes that users will adopt an innovation. However, unlike Rogers and Shoemaker (1971) who use the term adoption, "...to label the process of deciding to use a innovation ..", the model's use of the term "...involves the multitude of activities, decisions, and evaluations that encompass the broad effort to successfully integrate an innovation into the functional structure of a formal organization such as a school, a college, or an industrial organization" (Hall, et al., 1973, p. 5).

CBAM is based on the premise that change is a process of occurrences, many of which are predictable. In order for change to occur, individuals have to change. As individuals change, they move through a quasi-developmental pattern. By gaining an understanding of the individual's point of view about the change, i.e. the individual's stage in the change process, one can appropriately intervene and assist the individual through the next level of change, thereby facilitating the change effort. These strategies depend on the individual's "stage of readiness" which is determined by an individual's stage of concern and level of effective use of the innovation (Hall, et al., 1973, pp. 10-11).

Hall et al. (1973) initially conceptualized two dimensions in CBAM: Stages of Concern About the Innovation (SoC) and Levels of Use (LoU). The six Stages of Concern About the Innovation model was later refined to seven stages. The seven Stages of Concern About the Innovation (Hall & Hord, 1987, p. 60) (Appendix A) are simply defined as follows. Stage 0 (Awareness) is the "unrelated" concern in which the individual has little concern about or little awareness of the innovation. The cluster of "self" concerns includes: Stage 1 (Informational), in which there is an interest in obtaining more information about the innovation and Stage 2 (Personal), concerns about personal demands, adequacy, and role. Stage 3 (Management) are concerns related to "task" which include concerns about logistics and efficient use of resources with respect to the innovation. "Impact" concerns include: Stage 4 (Consequence), concerns about relevance for and impact on students' outcomes; Stage 5 (Collaboration), concerns about working with others in the use of the innovation; and Stage 6 (Refocusing), exploring benefits of or modifications/alternatives to the innovation.

Stages 2 through 6 of the seven Stages of Concern reflect Fuller's model (Fuller & Parsons, 1974) which are: "self" concerns (Stage 2, Personal), "task" concerns (Stage 3, Management), and "impact" concerns (Stage 4, Consequence, Stage 5, Collaborative, and Stage 6, Refocusing). CBAM's Stage 1, Informational concerns, does not emphasize the egocentric "self" interests, but reflects concerns of nonusers with respect to their learning more about the innovation (Rutherford, 1977).

The Levels of Use of the Innovation (LoU) is a second dimension of CBAM which identifies a differentiation between knowledge (breadth and depth) and action, i.e. to what extent, what degree, and how the individual is using the innovation. The focus of the LoU is not on the concerns of individuals, but rather what individuals are doing during the process of adopting a specific innovation. Hall et al. (1973) originally identified seven behavioral indices of LoU which were later termed and defined as follows (Hall, Loucks, Rutherford & Newlove, 1975; Hall & Loucks, 1977; Hord, Rutherford, Huling-Austin, Hall, 1987, pp. 54-71).

The Levels of Use range from no use through re-evaluating the innovation and exploring alternatives. At "Level 0 - Nonuse" the individual has little knowledge of and displays no movement toward being involved with the innovation. Individuals at "Level I-Orientation" begin acquiring information and considering the worth and demands of the innovation. After the user decides to use the innovation, the user moves the "Level II-Preparation". At "Level III - Mechanical Use" the user is focused on day-to-day issues (management/logistics) and mastery of the tasks involved in using the innovation. The user makes changes to address personal needs. "Routine - Level IVA" is the point of stabilizing the pattern of using the innovation. The state in which the user begins making changes in the use of the innovation to enhance the outcome for others, such as students, is "Level IVB - Refinement". At "Level V - Integration" the user collaborates with others in the use of the innovation to enhance the effect on clients. Users reach "Level VI - Renewal" when they re-evaluate the innovation and explore modifications or alternatives

to the innovation.

Exploratory attempts began in 1973 to assess the concerns of individuals toward innovations with different formats and methods, i.e. an open-ended concerns statement, checklists, and interviews (Hall, et al., 1986). Empirical investigations to verify the hypothesized seven SoC began in 1974 in cross-sectional and longitudinal studies of teachers and professors. Hall and Rutherford (1975) reported the findings from a pilot study of a 195 item instrument developed from written concerns of 300 teachers and professors about innovations in their respective schools and colleges. A sample of teachers completed the instrument with respect to team teaching, and college professors with respect to instructional modules. The samples were stratified according to no use with the innovation to those experienced with the innovation. The findings from the data (N=366) identified seven factors which appeared congruent with the hypothesized concern scales. Further instrument development resulted in a 35 item SoC Questionnaire (SoCQ). By spring 1974 the researchers identified two approaches for measuring the Stages of Concern (Hall, et al., 1986). The result of these strategies are the SoCQ (Hall, et al., 1986) and the Open-Ended Statement of Concern About an Innovation, i.e. "When you think about (Innovation), what are you concerned about?" (Newlove & Hall, 1976).

For several years the CBAM research team investigated the hypothesized concerns theory and tested the SoCQ with different samples and eleven educational innovations (Hall, et al., 1986). Hall and George (1979) reported the findings from a study conducted in September 1974 to investigate the reliability of the SoCQ. Teachers and professors

(N=421) completed the 35 item SoCQ in response to team teaching and instructional modules. Analysis of the data showed the alpha-coefficients for internal reliability ranged from .64 to .83 for the seven stages.

The Concerns-Based Adoption Model hypothesizes that users and nonusers of educational innovations have concerns which change as individuals become more familiar and experienced with the innovation. Nonusers express more "intense" concerns in Stages 0, 1, and 2 than in the later stages. As individuals begin to use the innovation, the intensity of concerns in Stages 0, 1, and 2 decreases, and Stage 3 (Management) concerns become more prominent. As the individual gains more experience with the innovation, earlier stages of concerns decrease and Stages 4, 5, and 6 become more intense. (Rutherford, 1977; Hall & George, 1979). The findings from a number of studies demonstrated the progression, developmental pattern of concerns and confirmed that concerns change as experience with the innovation increases.

George (1977) reports the findings of a study that tested the validity of the SoCQ and the hypothesized changes in concern. The study involved teachers in two elementary schools with the innovation of a reading program. The teachers were invited to attend a five week workshop to learn the new approach to teaching reading. Twenty-two teachers attended the five week workshop which was held over the summer. The second group of faculty (N=25) attended a one day workshop immediately before the new school year. Both groups had separate workshop meetings on the same day in different locations. Prior to training on that day, the two groups completed the SoC Questionnaire.

The findings from the responses showed those who had not received training expressed higher concerns in Stages 0, 1, 2, and 4. No significant differences were observed between the two groups in the remaining stages. These findings indicated that the workshop decreased Awareness (Stage 0), Informational (Stage 1), Personal (Stage 2) concerns, and Consequences (Stage 4) of the reading program on students.

Rutherford (1977) reported findings from research of the relationships between the affective measure of CBAM, the Stages of Concern, and the behavioral indicators, Levels of Use, to investigate the hypothesis of changes in concern with use of an innovation. These studies drew from the population used during two years of research. The criterion for sample selection was years of experience with the innovation. The population included teachers (N=453) employed in 39 public schools located in 3 states and professors (N=433) from 13 universities in 8 states. The teachers were concerned with the innovation of team teaching. The university professors were concerned with instructional modules. Over the course of the two years of research, the teachers completed 1,180 SoC Questionnaires. Professors completed 1,032. Focused interviews assesses the Levels of Use.

The findings from several studies concurred with changes of concerns with use of the innovation. In one study (Rutherford, 1977) comparisons were made over the course of two school years (Fall 1974 to Spring 1976) between a university that used instructional modules (University A) and one in which the majority of faculty did not use the modules (University B). University A used the instructional modules before the

investigation. Professors at both universities completed a SoCQ and LoU interview during each of the four semesters. Graphic comparisons between the SoCQ and LoU of the responses from University A showed the professors expressed high impact concerns (Stages 4, 5, and 6) and lower concerns in Stages 2 and 3. The LoU profile was beyond Level III. The SoC profile of University B demonstrated higher Stage 0, 1, and 2 concerns and lower in Stages 3, 4, 5, and 6. Their LoU profiles showed high ratings in Level I (Orientation) and Level II (Preparation). Additionally, although the administrators from University B endorsed the use of the modules, they made little effort to address the Informational concerns (Stage 1) expressed by the faculty SoC profile. Rutherford (1977) concluded that endorsement and encouragement was not enough to meet or resolve faculty concerns or promote university-wide use of the modules.

Findings with respect to team teaching in two public schools were similar to the findings in the universities (Rutherford, 1977). The responses from the SoCQ of teachers in a school that was considering team teaching showed a nonuser profile. The group expressed high Stages 0, 1, and 2, and low Stages 3, 4, 5, and 6 concern over the two year period. The LoU profile verified this finding which showed high Level 0 (Nonuse) and Level I (Orientation) during the first semester and high Level 0 during the remaining three semesters. The school using team teaching for several years had a user profile, high Stage 5 (Collaboration) concerns for which the school recruited a consultant to assist them with their collaboration efforts. Their composite LoU at IVA (Routine use) throughout the two year period verified their use of team teaching.

Findings in a third school demonstrate movement in the SoC and LoU profiles over a two year period in which the school moved from no use to use of team teaching (Rutherford, 1977). Teachers expressed a nonuser profile with high concern scores in Stages 0, 1, and 2 during the first two semesters, high Stage 3 (Management) concerns during the third semester which indicated initial use, and low overall concerns in the fourth semester. Their LoU profiles also reflected this pattern of change with a high Level I (Orientation) during the first semester, high Level II (Preparation) the second semester, high Level III (Mechanical) in the third semester, and high Level IVA (Routine) use the in the fourth semester.

The findings from the CBAM investigations concurred with Fuller's findings (1969), that later concerns emerge after the resolution of earlier concerns. The research also demonstrated that individuals express concerns in all stages at the same time, although the concerns vary in intensity. Interventions and contextual variables appeared to influence concerns (Hall & George, 1979). Additionally, the findings showed a progressional, developmental pattern in institutions that provided appropriate interventions. The change in SoC profiles in institutions where interventions responded to concerns suggests that interventions may influence positive results in the adoption of educational innovations. When no identifiable intervention was made, "the SoC profiles of these institutions remained virtually stable as did their level of adoption of the innovation" (Rutherford, 1977, p. 28). Additionally, Hall and George (1979, p. 26) note "...complexity of the innovation, support for the change effort, the attitudes of colleagues,



the role and skill of the unit manager (e.g. principals and deans) and external conditions seem to be relevant variables that must be taken into account in interpreting longitudinal SoCQ data".

The CBAM research team verified underlying assumptions about change that served as the foundation for CBAM and its research (Hord, Rutherford, Huling-Austin, Hall, 1987, p. 5-6). Their conclusions were:

1. Change is a process, not an event.
2. Change is accomplished by individuals.
3. Change is a highly personal experience.
4. Change involves developmental growth.
5. Change is best understood in operational terms.
6. The focus of facilitation should be on individuals, innovations, and the context.

Innovation Configuration (IC) is a third dimension of CBAM which assesses the variations of use of each component of an innovation. This acknowledges that innovations can be used in different ways by various individuals, i.e. innovations can take on different operational forms. Procedures for identifying IC include identification of the components of the innovation and variations of use, data collection through interviews and observations, developing a checklist for the users, and developing strategies (training) to facilitate the desired or creative operational forms (Hall & Loucks, 1981; Hord, et al., 1987, pp. 11-27).

CBAM is an action oriented model -- an approach to plan, monitor, and facilitate change -- that responds to expressed concerns about an innovation through interventions. Intervention to facilitate the change process is a key element in the model. Hall & Hord (1984, p. 275) define intervention as "an action or event or a set of actions or events that influences use of the innovation". The change facilitator provides interventions that "...are based on their *knowledge* of what is happening and their *concerns* about it, which in sum equals their motivation" (Hall & Hord, 1987, p. 221). The CBAM researchers developed a conceptual framework of interventions to help plan, facilitate, manage, and evaluate change. The framework, "Intervention Taxonomy" (Hall, Zigarmi, & Hord, 1979; Hall & Hord, 1984; Hall & Hord, 1987), describes the actions of change facilitators and events that may influence the change effort and use of the innovation.

Efforts to develop a taxonomy began with a review of the change literature which provided limited information with respect to how to operationalize interventions (e.g. Lewin's (1951) stages; Chin and Benne's (1985) strategies; and Havelock's (1973) plans). Taxonomy protocols evolved after more than two years of research of change efforts in schools and are based on quantitative and qualitative data and ethnographers' observations of interventions. The framework spans from global to "incident" level, actions or events that help resolve an individual's concerns. The hierarchial structure includes actions determined by "policy", formal policy (through authoritarian lines), or informal policy, such as those prescribed through group norms. The total "game plan" is the overall design of the change effort which describes the approach and interventions throughout the

process. Six primary clusters of interventions comprise levels of the "game plan component". The model also includes "strategies", e.g. training, and "tactics", e.g. workshops. The "Game Plan Component" of CBAM is used in business and industry (Mink, et al., 1993).

Assessing, prescribing, and intervening are the tasks of the change facilitator. As the preconditions of the change facilitator are to understand the practices and concerns of users involved in the change, research suggested that change facilitators have concerns about their role of implementing change. In 1979 the CBAM researchers developed the Change Facilitators Stages of Concern About the Innovation model and questionnaire, both of which are similar to the original SoC framework and SoCQ (Rutherford, Hall, & George, 1982; Hall, Newlove, George, Rutherford, & Hord, 1991).

### **Application of CBAM**

Although CBAM research concentrated on educational institutions and conventional educational innovations, such as teaming or new programs, the model and its dimensions are used and are gaining acceptance outside of the education arena. Mink et al. (1993, p. 17) acknowledge that "...CBAM concepts [are]equally applicable when introducing change in business and industry." Their model for organizational change, Total Transformation Management Process (TTMP), includes six models, one of which is CBAM. They recognize the significance of CBAM, especially for providing facilitators with a framework for identifying concerns of individuals, a guide to develop action plans

and interventions, and a means to map and gauge the change process. The TTMP includes CBAM's Stages of Concern, Level of Use, Innovation Configuration, and Game Plan Components.

CBAM is identified in several corporate settings with different innovations. Chute (1984) presented CBAM at the 1984 International Teleconference Symposium as a framework for change agents to facilitate a smooth transition and avoid adverse effects in the social environment of a corporate setting which is implementing teletraining. He recognizes that clients will naturally resist a change and offers typical concerns expressed by clients who are planning teletraining. Chute urges change agents to formally assess client concerns by questionnaires and interviews. He suggests using CBAM as a diagnostic tool, to monitor changes in concerns, and as a guide to determine appropriate interventions to facilitate client acceptance.

Vanterpool (1987) used CBAM's SoC to investigate the concerns of the American Society for Training and Development (ASTD) training managers about the ASTD's competency model. The study population represented eight industries in three states. The majority of the respondents (N=86) came from the manufacturing, services, and finance/insurance/real estate industries. The responses from a modified SoCQ and open-ended statements supported concerns theory with respect to knowledge/experience and use/nonuse and the Stages of Concern. More than half of the respondents were not familiar with the ASTD model. The respondents indicated in the open-ended statements that they wanted more information which was verified in their stages of concern. Seventy-

three percent of the respondents expressed high Stage 0 (Awareness) concerns. Thirteen percent demonstrated high Stage 1 (Information) concerns.

Jordan-Marsh (1984) used the SoC to investigate attrition in exercise programs. She adapted the original SoC Questionnaire and developed the Stages of Concern for Exercise Scale (SOCE). The study population were employees of a design and manufacturing company that sponsors a health promotion program. The purpose of the study was to determine if the SOCE would be a valid and reliable method to assess the concerns of company employees who have access to a work site health program about changing exercise behavior. The findings from 214 respondents who completed the SOCE showed relationships between the SOCE subscale scores and self ratings on variables regarding exercise. There was a negative correlation between enrollment in a formal health program or gym and Stage 0 concerns which Jordan-Marsh renamed "Indifference". Respondents who did not consider themselves expert at exercising expressed higher levels of concerns in Stages 1 through 4. Jordan-Marsh concluded that these findings were compatible with the SoC hypothesis which suggests that individuals with low expertise would have high concerns about exercising issues. The findings suggested tentative validity of the SOCE.

There is supporting evidence of the utility of the SoC in DoD as observed from the findings of two studies which involved military organizations. Barucky (1984) investigated the concerns of Air Force officers, cadets, and trainees with respect to leadership development in the Air Force Professional Military Education programs. The

purpose of his research was twofold. He explored if concerns theory could be extended to these Air Force personnel and if a valid and reliable instrument could be developed to identify concerns about leadership development to assist curriculum planners. Barucky made major modifications of the original SoCQ, the result of which was the Personal Leadership Skills Development Concerns Questionnaire. The respondents of the study sample (N=614) were grouped by years of leadership experience and professional experience by officer rank and other subgroups. The major findings by years of leadership experience showed the observable developmental pattern of concerns theory. Respondents with no experience expressed high levels of concerns in the earlier stages and lower levels of concern in the later stages. Those with the most experience expressed lower levels of concern in earlier stages and high levels in later stages. There were significant differences in Stage 0, 1, and 2 between respondents with four or more years of experience and those with no experience. No significant differences were observed in Stages 4 and 5. There were significant differences in Stage 6 between the respondents with no experience and those with more than 8 years of experience. Findings from the officer ranks subgroups (N=459), showed a similar developmental pattern of concerns theory. However, other than Stage 1, a consistent pattern was not observed as with the variable leadership experience. Leadership experience seemed to have a greater impact on concerns than did rank.

Bernier (1990) made minor modifications in several of the questionnaire items of the SoCQ to investigate the concerns of Marine Corps officers about changes in their

Professional Military Education Program. The findings of Bernier's research was based on the responses of 173 Company Grade officers (Second Lieutenant, First Lieutenant, and Captain) and Field Grade officers (Majors, Lieutenant Colonel, and Colonel). The research demonstrated non-user profiles for the two groups which was consistent with concern theory, as the program changes were recent. Both groups expressed high Stage 2 (Personal) concerns. The concern profiles differed between the Company Grade and Field Grade officers. The Company Grade officers had a negative one/two split (Informational, Stage 1 and Personal, Stage 2) concerns and a tailing-off of Stage 6. The "negative one/two split" defined by Hall, et al. (1986, p. 36) "..occurs [when] personal concerns (Stage 2) override concerns about learning more about the innovation (Stage 1)". The profile indicated the respondents were not seeking more information, had intense personal concerns, and did not have a negative orientation to the changes (Stage 6). The profile of the Field Grade officers also showed a negative one/two split, but had tailing up of Stage 6 (negative orientation toward the changes). There was significance differences between the two groups on Stage 4, Consequences. The Company Grade officers indicated concerns about the changes with respect to Marines. The Field Grade officers expressed little concern about the changes with respect to Marines. Based on these findings, Bernier made recommendations for program improvement.

## **CHAPTER 3**

### **METHOD**

Chapter 3 describes the method used in the study. The chapter is divided into five primary sections to discuss the research design, the population of the study, instrumentation, procedures of data collection, and methods of data analyses. The instrumentation section discusses the validity and reliability of the original SoC Questionnaire and the application of different versions of the instrument. The modified version of the SoC Questionnaire used for this study is described. This section also explains the method used for scoring the instrument and interpretation.

#### **Research Design**

This study used a survey research design to explore the concerns of civilian DFAS managers about satellite education and training. The sample was unevenly distributed across the five locations to such an extent that a stratified random sample with proportional allocation for each Center may not have ensured a significant response rate from each Center. Therefore, a census was conducted. A mailed questionnaire was the method of data collection.



## **Population and Sample**

The population for this study was 726 civilian managers who were identified in a data base obtained from DFAS Headquarters as managers who were employed at one of the five DFAS Centers. The DFAS Centers are located in: Indianapolis, Indiana; Columbus, Ohio; Cleveland, Ohio; Denver, Colorado; and Kansas City, Missouri. Each Center serves one of five DoD organizations (Table 1).

A segment of the population used PictureTel which is a videoteleconferencing system that is used primarily for administrative meetings and occasionally for educational programs. The managers had used or would be using satellite education/training and managing employees who also were or would be using satellite education/training.

## **Instrumentation**

The "Satellite Education and Training Survey" was the data collection instrument for the study. The questionnaire is comprised of: (a) a modified version of the original Stages of Concern Questionnaire (SoCQ) (Hall, George & Rutherford, 1986); (b) the Open-Ended Statement of Concern About an Innovation (Newlove & Hall, 1976); and a comment section (Appendix B).

**Table 1**

**DFAS Centers, Service Organization, and Civilian Manager Population**

<b>CENTER</b>	<b>SERVICE ORGANIZATION</b>	<b>CIVILLIAN MANAGER POPULATION N=726</b>
Columbus, Ohio	Defense Agencies	252
Denver, Colorado	Air Force	151
Indianapolis, Indiana	Army	136
Kansas City, Missouri	Marine Corps	62
Cleveland, Ohio	Navy	125

### **Stages of Concern Questionnaire**

The SoCQ is a 35 item, 8 point Likert scale questionnaire that measures people's concerns about change. Hall and others (1986) developed the SoCQ in 1974 to measure concerns of educators about educational innovations. The SoCQ measures an individual's level of concern which is defined in the Stages of Concern About the Innovation model. The SoC is one dimension of the Concerns Based Adoption Model developed by Hall, et. al. (1973). The seven stages (Appendix A) progress from "unrelated" concerns (Awareness), to concerns about "self" (Informational and Personal), to concerns about "task" (Management), and to "impact" concerns (Consequence, Collaboration, and Refocusing).

Five statements for each of the seven stages are dispersed throughout the two pages of questionnaire items. Questions 3, 12, 21, 23, and 30 address Stage 0 (Awareness). Items 6, 14, 15, 26 and 35 address Stage 1 (Informational). Statement 7, 13, 17, 28, and 33 refer to Stage 2 (Personal). Questions 4, 8, 16, 25, and 34 address Stage 3 (Management). Questionnaire items 1, 11, 19, 24, and 32 address Stage 4 (Consequence). Statements 5, 10, 18, 27, and 29 address Stage 5 (Collaboration). Questions 2, 9, 20, 22, and 31 address Stage 6 (Refocusing). Stage grouping of the modified questionnaire items used for this study are shown in Appendix D.

## **Validity and Reliability**

More than 500 professors and teachers were involved in the development of the Stages of Concern Questionnaire (George, 1977). Confidence in the instrument is based on the reliability, internal consistency, and validity obtained through cross-sectional and longitudinal studies with different samples from educational institutions and 11 different educational innovations. The norming group for the SoCQ consisted of teachers and administrators from elementary schools through higher education (Hall, et al., 1986).

The CBAM researchers conducted numerous studies to investigate the reliability and validity of the SoCQ. George (1977) reported the findings of a reliability study conducted in 1974. Findings from the responses of teachers and professors (N=830) about the innovations of team teaching and instructional modules showed the alpha coefficients (internal reliability) for the stages ranged from .64 to .83. Six of the seven alpha coefficients were greater than .70. Two weeks following the initial test, a subsample from the initial pilot group (N=132) completed the SoC Questionnaire. Test-retest stage score correlations using Pearson-r ranged from .65 to .86. Four of the seven stage correlations measured greater than .80.

For the two years after the development of the SoCQ, the researchers conducted validity tests by comparing ratings of the questionnaire with interviews, Open-Ended Concerns Statements, and Level of Use Interviews (Hall et al., 1986). In 1976 in a test-retest study (Hall & George, 1979), a random sample of 28 teachers and 37 professors was selected from the initial test group for taped interviews and the second administration

of the questionnaire. Reliability of the staff ratings of the interviews on the "highest" and "also highest" concerns ranged from .42 to .85. With the exception of Stage 3 (.42,  $p = .06$ ), all stages were above .58 ( $p < .01$ ). Correlations between the investigator ratings and the SoC rank order percentile scores for Stages 0, 1, 2, 3, 5, and 6 were low, ranging from .27 to .54, but significant ( $p < .01$ ). Stage 4 was not significant ( $r = .13$ ). With the exception of stage 4, Hall and George (p. 16) concluded that these findings supported the validity of the SoCQ.

Longitudinal studies using the SoCQ provided convincing evidence that the pattern of concerns shift over time with involvement with the innovation. George (1977) reported that the findings from two longitudinal studies indicated concerns shift over time as an individual gains experience with an innovation. Individuals with little experience had higher Awareness, Informational, and Personal concerns than those with more experience with the innovation. Individuals who had experience with the innovation expressed higher Collaboration and Refocusing concerns than those with no experience.

Hall, et al.'s (1986) report of a two year study of teachers' concerns about team teaching showed a similar pattern of development. Initial concerns scores were high for Stages 0, 1, and 2 then moved to high Stage 3 concerns to relatively low scores in all stages.

## **Application of the SoCQ**

The SoCQ has been used in various settings with different populations and different versions (Hall, Newlove, George, Rutherford, & Hord, 1991). The questionnaire has gained international recognition in Australia and Canada, was translated into Flemish for use in Belgium and The Netherlands, and was piloted in Indonesia, Venezuela, and Thailand. Several researchers (Kolb, 1983; Martin, 1989; Barucky, 1984; Jordan-Marsh, 1985) made major adaptations of the SoC Questionnaire for their studies and followed the steps used when developing and validating the original SoC Questionnaire.

Kolb (1983) developed a version of the SoCQ to study the concerns of 718 nurses from four educational programs in various phases of professional preparation (prenursing students, and nursing students, and practicing nurses). This instrument demonstrated alpha-coefficients ranging from .75 to .87. In a test retest reliability estimate with 70 individuals, Pearson r correlation coefficients ranged from .64 to .86. Martin (1989) developed a 32 item SoCQ to study the concerns of 388 computer users and nonusers. Her instrument demonstrated coefficients of internal reliability ranging from .65 to .83. Barucky (1984) developed a version of the SoCQ to investigate the concerns of 614 Air Force officers, cadets, and trainees about leadership development in military education programs. The alpha-coefficients for internal reliability of his instrument for the seven stages ranged from .60 to .81 (Hall, et al. 1991). Jordan-Marsh (1985) modified the SoCQ and developed the Stages of Concern for Exercise scale to investigate concerns of 214 subjects regarding exercise habits. The alpha reliability coefficients for the seven

stages ranged from .50 to .82.

Bernier (1990) made minor revisions to the original SoC Questionnaire to study the concerns of Marine Corps Officers. He replaced the words "students" and "faculty" with "Marines" in the questionnaire items 1, 5, 10, 11, 19, 22, 24, 29, and 32 (the items modified for this study). The field test of this instrument demonstrated a high alpha-coefficient of .90 with the Kuder-Richardson Formula 20.

### **Satellite Education and Training Survey**

The Satellite Education and Training Survey is a modified version of the SoCQ. To appropriately address the DFAS managers for this study, Sections A and C of the Satellite Education and Training Survey were modified from the original SoCQ which was designed for educators employed in formal educational institutions. With the approval of Dr. Gene Hall the wording in the introductory page, in several of the questionnaire items, and the title on the questionnaire item pages were modified as shown in Appendix B, Section C. The word "students" was replaced by the word "employees" in questions 1, 11, 19, 22, 24, and 32 and the word "faculty" was replaced by the word "managers" in questions 5, 10, and 29 (Appendix E). These changes are similar to those made by Bernier (1990) for studying concerns of Marines about a military education program. Bernier (1990) modified the SoCQ by changing the words "students" and "faculty" to "Marines". Additionally, the header on the pages of the original SoCQ which read "SoC Questionnaire Items " was changed to "Concerns Questionnaire ".

The demographic section of the Satellite Education and Training Survey (Appendix B, Section A) requested the information required for the study that was not provided from the existing profiles of the respondents obtained from DFAS. These variables were gender, age, racial/ethnic background, the number of employees the manager directly supervises, the number of employees within the scope of the manager's responsibilities, number of years employed in the financial management career field, and number of courses completed by satellite. Additionally, the Open-Ended Statement of Concern About an Innovation (Newlove & Hall, 1976), "When you think about (innovation), what are you concerned about?", was added to the instrument. This questions reads: "When you think about satellite education/training for DFAS employees, what are you concerned about?" (Appendix B, Section B).

### **Assessment of the Stage Concerns**

The scoring procedures used for the original SoCQ (Hall, et al., 1986) were used for the Satellite Education and Training Survey. Each of the seven Stages of Concern was determined by tallying the respondent's score for the five questionnaire items for the respective stage. The raw scores for each stage were converted to the normed percentiles. Group profiles are generated by obtaining the normed percentile for each of the stages for each individual and calculating the mean percentile for the group. This study used both the individual and group percentile scores to identify the Stages of Concern.



The SoCQ percentiles were based on the responses of a selected, stratified sample of 646 individuals from elementary schools and higher education (Hall, et al., 1986). The sample completed the SoCQ in 1975 and represented a range of experience in team teaching or instructional modules. Numerous studies demonstrated that the SoCQ normed percentiles identify the intensity of concerns of people about change. Although used primarily in educational institutions, Bernier's (1990) findings demonstrated the effectiveness of the SoCQ percentiles to assess the concerns of Marines Corps officers.

The sample for this study was comprised of managers in DoD who were confronted with change. The managers are leaders, and, as such, the managers are teachers and administrators, not unlike the standardization sample of the SoCQ. Although the managers' issues about the innovation may have differed from those of education administrators and teachers, issues may differ between or within any population over a variety of variables. The process throughout the change should follow the predictable course as CBAM hypothesizes.

### **SoCQ Interpretation**

Interpretation varies by level of detail (Hall, et al., 1986). Single peak scores, highest and second highest scores, or individual or group profiles can be analyzed. Briefly, single stage peak scores for stages 1 through 6 are interpreted by stage definition. For example, a high stage score in Stage 2 indicates high personal concerns. Highest and second highest combination scores can identify the development process of concerns.

Profiles examine all stage scores and their relationships. This study interpreted group profiles and the highest stage for groups and individuals.

Stage 0 is more difficult to interpret and requires further information, such as, user/nonuser. High scores in Stage 0 suggest low concern, and low scores suggest high concern. For the nonuser, a high Stage 0 may indicate lack of knowledge about the innovation or little concern. However, Hall et al. (1986) notes that Stage 0 scores may shift for users due to the questionnaire items for that stage. For example, in response to item 21, "I am completely occupied with other things", users may express high scores.

Nonusers and users of the innovation typically express the following concerns. The nonuser usually scores highest on Stages 0, 1, and 2, and lowest on Stages 4, 5, and 6. If the nonuser expresses a positive perspective, Stage 1 score is higher than Stage 2, Stage 3 is a medium score, Stages 4 and 5 scores are low, and Stage 6 scores tail off. Additionally, a tailing-up of Stage 6 scores for nonusers may indicate potential resistance.

Profiles of users most frequently have single peak scores in Stages 3, 4, 5, or 6. Although multiple peak scores are less common than expected, a high Stage 3 and 6 is a common example. The guidelines for interpreting the SoC profiles and the high and second high percentile scores include developing an overall perspective of the responses to the Stages of Concern and studying the high and low scores, individual item responses, and the total score (Hall, et al., 1986, pp. 53-55).

## **Data Collection**

A packet, which contained a cover letter, questionnaire (Appendix B), and a return-addressed, stamped envelope, was mailed to each manager employed in the 5 DFAS Centers. The cover letter (Appendix B) was signed by the Deputy Director for Human Resources, DFAS Headquarters, and accompanied the questionnaire. The letter explained the purpose and significance of the survey, ensured confidentiality of participation, defined the innovation, provided a point of contact for questions regarding the survey, and instructed the respondents to return the completed questionnaire in the enclosed, return-addressed envelope within 5 days from the date of receipt. The return envelope was addressed to DFAS Headquarters, Human Resources in Arlington, Virginia and to my attention. Those who did not respond two weeks after the initial mailing were sent a second letter (Appendix C) and a questionnaire. Data collection continued for four weeks after the second mailing. No further follow-up attempts to contact nonrespondents were made after the four week time frame following the second mailing.

The letters RC (respondent code) were inserted on the upper right corner of the first page of the Satellite Education and Training Survey. Each questionnaire was assigned a respondent code to identify the respondents from the nonrespondents and to match each completed questionnaire to the respective demographic profiles provided by DFAS.

## **Data Analysis**

### **Preparation of Data**

A data base was prepared from the profiles provided by DFAS Headquarters and responses from the questionnaires. The data obtained from DFAS Headquarters (respondent name, Center location, educational level, and date of employment in the federal government) were coded and entered into the data base. The returned questionnaires from each Center were counted and reviewed for completeness. To meet the criteria for the study, at least one of the two questions in the demographic section of the questionnaire which read, "How many employees report directly to you?", and "How many total employees report to you and to the supervisors who work for you?" had to be answered with a numerical value greater than 0. Questionnaires that did not meet this criterion were eliminated. Additionally, questionnaires with missing items on the Concerns Questionnaire, Section C (Appendix B), were eliminated from the analysis of that section of the instrument. The responses for each of the 35 questionnaire items were entered into the data base for the respective respondent. Responses from the demographic section of the questionnaire were coded and entered into the data base.

The demographic variables: DFAS Center, gender, age, educational level, and racial/ethnic background were coded categorically. Years of federal employment, years of employment in the financial management career field, number of employees within the managers' scope of responsibility, and number of courses completed by satellite were

treated as continuous variables.

### Analyses

Baseline procedures for scoring the SoCQ followed those described by Hall, et al. (1986). Data were analyzed by the computer program developed by the CBAM project and Number Cruncher Statistical System (NCSS). Stages of Concern were determined by percentile scores. The analyses included both group level data and individual level data. The categorical variables: age, gender, racial/ethnic background, and educational level, were used to describe the population.

To answer research question Number 1, "What are the Stages of Concern of the DFAS managers toward satellite education/training?", a frequency distribution of the highest stage for each respondent in the total population was determined. A group profile for the total population was generated by Hall, et al.'s (1986) norming table. Question Number 2, "Are the managers' predominant Stages of Concern about satellite education/training independent of Center site, each of which serves one of five DoD organizations: (Army, Air Force, Navy, Marine Corps, and Defense Agencies)?" was divided into part a and part b for data analyses. Question 2a was "What are the Stages of Concern for each of the five Centers?". The managers' responses were sorted by Center. A frequency distribution of the highest stage for each respondent at each Center was determined. A group profile for each Center was generated. In answer to question 2b, "Are the managers' predominant Stages of Concern about satellite education/training

independent of Center site?", cross tabulations were used to determine whether there was an association between the highest stage and the Centers by comparing the frequency and percents of the respondents' highest stage at each Center.

Correlational analysis was used to answer the research question Number 3, "Is there a relationship between the managers' predominant Stages of Concern about satellite education/training and the number of employees within the scope of the managers' responsibilities?". Pearson r was used to determine if there was a correlation between the highest stage of concern for each respondent and the total number of employees within the respective manager's scope of responsibility.

Question Number 4, "Is there a relationship between the managers' predominant Stages of Concern about satellite education/training and years of employment in the federal government?", was analyzed in the following manner. Pearson r was used to determine if there were correlations between the highest stage of concern for each manager and the manager's length of employment in the federal government. The same analysis was used to answer question Number 5, "Is there a relationship between the managers' predominant Stages of Concern about satellite education/training and years of employment in the financial management career field?".

Question Number 6, "Is there a relationship between the managers' Stages of Concern about satellite education/training and the number of courses completed by satellite?", was investigated in the following manner. Group profiles by the number of courses completed by satellite were generated for graphic comparison. Pearson r

correlations was used to determine if there was a relationship between the highest stage of each respondent and the number of courses completed by satellite.

The responses to the Open-ended Statement, "When you think about satellite education/training for DFAS employees, what are you concerned about?", were sorted by Center and by course completion groups. Each response was categorized by the expressed comments of the respondents. Recommendations were made based on the findings.

## **CHAPTER 4**

### **RESULTS**

Chapter 4 describes the results of the study. The chapter includes the sample selection and response rate and demographic profiles of the respondents, presents the data analysis of the research questions guiding the study, and summarizes the responses from the open-ended statement.

#### **Sample Selection and Response Rate**

The survey questionnaire and a letter dated May 3, 1996 (Appendix B) were mailed to each of the 726 DFAS managers who were identified in the data base obtained from DFAS Headquarters as those employed in one of the five DFAS Centers. The first mailing prompted phone calls from the Centers. Many of the calls were from the subjects who informed me they were no longer supervisors. This was anticipated as the downsizing in the federal government continues and the ratio between manager and employee population is expected to widen. Additional phone calls were made by colleagues or supervisors of the subjects who were concerned that the requested five day return time would not be possible, as several of the prospective respondents were either on vacation or work-related travel. Additionally, a total of 14 employees were reportedly retired or separated from the DFAS Centers. However, within two weeks following the



first mailing, the response was 241 questionnaires.

Those who did not respond two weeks after the first mailing were sent a second questionnaire which was coded for the second mailing and a letter dated May 23, 1996 (Appendix C). Data collection continued through the fourth week after the second mailing in response to the flow of returns from both mailings. The total response from the first mailing was 305 questionnaires and 110 from the second mailing. A total of 415 questionnaires were returned.

Each questionnaire was examined for the criterion of manager. Forty-four respondents indicated they were not a manager either by a special notation on the questionnaire or by responding to items 5 and 6 in Section A of the questionnaire (Appendix B) with a numerical value of "0". These questionnaires were eliminated from the study. The total response rate from managers was 55% (N=370). The responses from the Centers ranged from 61% (Denver) to 37% (Kansas City). This response rate was based on the total known available population meeting the study criterion of a manager employed at one of the five DFAS Centers. Therefore, the initial population was reduced from 726 to 668, as 14 potential respondents were no longer employed at the Centers and 44 individuals were no longer managers. Table 2 shows the distribution and return rate.

Subsets of the population were determined by the completion of each section of the questionnaire. Responses from the subsets were analyzed to answer the research question which pertained to the respective group. The distribution of responses for each section of the questionnaire are shown in Table 3.

**Table 2**

**Distribution and Return Rate of Survey Questionnaire**

Center	Columbus	Denver	Indianapolis	Kansas City	Cleveland	Total
(n=# sent)	(n=252)	(n=151)	(n=136)	(n=62)	(n=125)	(N=726)
<b>n=# sent meeting criteria*</b>	<b>n=230</b>	<b>n=142</b>	<b>n=116</b>	<b>n=59</b>	<b>n=121</b>	<b>N=668</b>
<b># returned meeting criteria**</b>	<b>Freq</b>	<b>Freq</b>	<b>Freq</b>	<b>Freq</b>	<b>Freq</b>	<b>Freq</b>
	<b>136</b>	<b>87</b>	<b>60</b>	<b>22</b>	<b>65</b>	<b>370</b>
	<b>59</b>	<b>61</b>	<b>52</b>	<b>37</b>	<b>54</b>	<b>55</b>

All percents rounded to nearest whole percent

\* known available population of managers employed at DFAS Centers

\*\* manager currently employed at one of the DFAS Centers

**Table 3**

**Distribution of Responding Managers by Questionnaire Section Completed**

Center	Columbus (n=136)		Denver (n=87)		Indianapolis (n=60)		Kansas City (n=22)		Cleveland (n=65)		Total (N=370)	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
<b>A</b>	126	93	79	91	56	93	20	91	61	94	342	92
<b>B</b>	112	82	64	74	53	88	20	91	56	86	305	82
<b>C</b>	124	91	82	94	56	93	20	91	59	91	341	92
<b>A+B</b>	105	77	59	68	53	88	18	82	52	80	287	78
<b>A+C</b>	116	85	74	85	53	88	18	82	56	86	317	86
<b>B+C</b>	102	75	59	68	53	88	18	82	52	80	284	77
<b>A+B+C</b>	97	71	54	62	50	83	16	73	49	75	266	72

All percents rounded to nearest whole percent

- Section:
- A demographics
  - B written response to “When you think about satellite education / training for DFAS employees, what are you concerned about?”
  - C Concerns Questionnaire

## **Demographic Profiles of Respondents**

The demographic characteristics of the respondents are divided into four profiles: personal and academic; employment; management responsibility; and satellite education experience. The following discussion describes these demographic characteristics.

### **Personal and Academic Profile**

With respect to the personal characteristics (Table 4), gender was more equally distributed within the DFAS manager sample population (N=370) than anticipated (approximately 42% females and 58% males and no response from 3 subjects). The Columbus Center had a nearly equal distribution with 50% females and 49% males (one missing value). However, there were approximately twice as many male than female respondents from the Denver and Indianapolis Centers.

Five percent of the population did not report age. Age ranged from 29-63 (N=353). Approximately 50% of the population were between the ages of 41 and 50. With regard to the race/ethnicity, 3% provided no response, 75% were White, 16% African American, and of the remaining 6% minority, 3% were Hispanic. All respondents to this variable (n=21) from Kansas City were White.

The academic level of the population (Table 4) ranged from some high school (<1%) to Master's degrees (16%). Approximately 55% of the total population had a minimum of a Bachelor's or Professional degree. However, educational level between the

**Table 4**

**Personal and Academic Characteristics**

Center	Columbus (n=136)		Denver (n=87)		Indianapolis (n=60)		Kansas City (n=22)		Cleveland (n=65)		Total (N=370)	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
<b>Gender</b>												
Female	68	50	28	32	19	32	12	55	27	42	154	42
Male	67	49	57	66	41	68	10	46	38	58	213	58
no response	1	1	2	2							3	1
<b>Age</b>												
29 - 35	23	17	2	2	4	7	1	5	5	8	35	9
36 - 40	22	16	4	5	9	15	3	14	5	8	43	12
41 - 45	29	21	15	17	8	13	6	27	16	25	74	20
46 - 50	34	25	29	33	21	35	4	18	20	31	108	29
51 - 55	16	12	23	26	12	20	5	23	13	20	69	19
56 - 63	8	6	7	8	3	5	2	9	4	6	24	6
no response	4	3	7	8	3	5	1	5	2	3	17	5

All percents rounded to nearest whole percent

**Table 4 (continued)**  
**Personal and Academic Characteristics**

Center	Columbus (n=136)		Denver (n=87)		Indianapolis (n=60)		Kansas City (n=22)		Cleveland (n=65)		Total (N=370)	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
<b>Ethnicity</b>												
White	96	71	71	82	44	73	21	96	45	69	277	75
African American	27	20	5	6	10	17	0	0	18	28	60	16
Hispanic	6	4	3	3	1	2	0	0	1	2	11	3
Other	3	2	4	5	4	7	0	0	0	0	11	3
no response	4	3	4	5	1	2	1	5	1	2	11	3
<b>Education Level</b>												
Some High School												
HS diploma/GED	22	16	10	11	10	17	7	32	16	25	65	18
Occupation Program Complete	3	2	1	1	1	2			1	2	6	2
<1-2yrs. College (no degree)	31	23	12	14	6	10	6	27	9	14	64	17
Associate's degree	7	5	5	6					5	8	17	5
3-4yrs. College (no degree)	4	3	1	1	2	3	2	9	1	2	10	3
Bachelor's degree	53	39	36	41	23	38	5	23	21	32	138	37
Professional degree			1	1	2	3			5	8	8	2
Master's degree	16	12	21	24	16	27	2	9	6	9	61	16

All percents rounded to nearest whole percent

Centers was not evenly distributed. The highest level of education for approximately 1/3 of the Kansas City population and 1/4 of the Cleveland population was high school or equivalent, whereas approximately 1/4 of the respondents from both the Denver Center and the Indianapolis Center earned Master's degrees.

### **Employment Profile**

The employment profile showed that 61% of the total population were employed in the federal government for more than 15 years and 1/3 of this subset worked for the system more than 25 years (Table 5). The Denver and Cleveland Centers had the largest proportion of federal employment longevity compared to the other three centers. Fifty-four percent of the Denver Center managers and 56% of Cleveland Center population had worked for the federal system for more than 20 years. The Columbus Center reported the greatest proportion of managers (31%) compared to the other centers with the least federal government employment history, i.e. 10 or less than 10 years.

Of the 370 respondents 350 worked in the financial management career field (Table 6). The remaining 20 had supervisory responsibilities in various support services in the Centers, such as legal, personnel, or facilities operations. Additionally, 7 respondents (2% ) of the financial managers did not respond to the variable years of employment in the financial management career field. However, by title and position there is confidence that they are financial managers and, therefore, were not eliminated from this discussion.

**Table 5****Years of Employment in the Federal Government**

<b>Center</b>	<b>Columbus</b>		<b>Denver</b>		<b>Indianapolis</b>		<b>Kansas City</b>		<b>Cleveland</b>		<b>Total</b>	
	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>
<b>1 - 5</b>	7	5	2	2	7	12	2	9	6	9	24	6
<b>6 - 10</b>	36	26	7	8	4	7	3	14	9	14	59	16
<b>11 - 15</b>	30	22	11	13	12	20	4	18	6	9	63	17
<b>16 - 20</b>	31	23	20	23	11	18	4	18	8	12	74	20
<b>21 - 25</b>	18	13	21	24	13	22	5	23	20	31	77	21
<b>26 - 35</b>	14	10	26	30	13	22	4	18	16	25	73	20
<b>Total</b>	136	37	87	24	60	16	22	6	65	18	370	100

All percents rounded to nearest whole percent



**Table 6**

**Years of Employment in the Financial Management Career Field**

<b>Center</b>	<b>Columbus</b>		<b>Denver</b>		<b>Indianapolis</b>		<b>Kansas City</b>		<b>Cleveland</b>		<b>Total</b>	
	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>
<b>1 - 5</b>	20	15	3	4	3	5	2	11	15	23	43	12
<b>6 - 10</b>	25	19	5	6	8	15	3	17	13	20	54	15
<b>11 - 15</b>	32	24	6	8	10	18	4	22	5	8	57	16
<b>16 - 20</b>	26	19	22	28	8	15	4	22	10	16	70	20
<b>21 - 25</b>	16	12	15	19	13	24	3	17	9	14	56	16
<b>&gt; 25</b>	12	9	26	33	12	22	2	11	11	17	63	18
<b>*nr</b>	4	3	1	1	1	2	0	0	1	2	7	2
<b>Total</b>	135	39	78	22	55	16	18	5	64	18	350	100

All percents rounded to nearest whole percent

\*nr no response

Of the 343 respondents reporting years of employment in financial management, 55% worked in the career field for more than 15 years. One-third of this subset was employed at the Denver Center. Denver had the most experienced population of all the centers. Approximately 80% (one missing value) of the respondents from the Denver Center had 15 years of experience, and 1/3 of the managers (n=26) from Denver reported more than 25 years in financial management. However, of those who responded to this variable (N=343), 28% reported less than 11 years of experience. Forty-six percent (46%) of this group were employed at the Columbus Center. Although Columbus had the greatest number of managers in this least experienced group (n=45), the Cleveland Center had the greatest percent (43%) of managers with less than 11 years of experience compared to the other Centers.

### **Management Responsibility Profile**

The responses to the questions in the demographic section of the questionnaire which asked the respondents how many employees reported directly to them and to the respondent's subordinate supervisors ranged from 1 to 8,500 (Table 7). During the time of data collection, none of the Centers employed more than 3,200 employees. The total personnel population per Center and reporting operating locations (OPLOCs) ranged from approximately 1,000 to 8,500 employees. Therefore, it is assumed that the responding Center Directors and Deputies included within their management responsibilities the personnel employed at their respective reporting OPLOCs. However, as would be

**Table 7**

**Manager Population by Employee Responsibility**

Center	Columbus n=136		Denver n=87		Indianapolis n=60		Kansas City n=22		Cleveland n=65		Total N=370	
	Employees	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq
1 - 10	31	23	24	28	15	25	8	36	17	26	95	26
11 - 20	40	29	26	30	18	30	7	32	19	29	110	30
21 - 30	12	9	11	13	6	10	2	9	4	6	35	9
31 - 40	16	12	5	6	4	7	2	9	5	8	32	9
41 - 50	6	4	4	5	1	2			2	3	13	4
51 - 100	13	10	4	5	4	7	1	5	9	14	31	8
101 - 200	7	5	8	9	4	7	2	9	7	11	28	8
201 - 500	8	6	2	2	3	5			1	2	14	4
>500	3	2	3	3	5	8			1	2	12	3

All percents rounded to nearest whole percent

expected, the more senior management population was minimal. Only 3% (n=12) of the population reported responsibility for more than 500 employees.

A total of 56% of the managers reported responsibility for 1-20 employees. Twenty-six percent (26%) reported 1-10 employees. The mean manager:employee ratio of this 26% was 1:7. This ratio is stated in the Report of National Performance Review (Gore, 1993, p. 13) as the average throughout the federal government.

### **Satellite Education Experience Profile**

Little experience with satellite education was reported (Appendix F). The range for number of courses completed by satellite was 0 to 19. Approximately 16% (n=60) of the population reported completing at least one course by satellite. The progression of experience with this medium appeared related to the length of time the respective Center had an operational one-way video, two-way audio satellite system. The Indianapolis Center was the first to have their system in place and had the greatest number of personnel who completed two or more courses by satellite. By the order of functioning system and amount of experience, Indianapolis was followed by Columbus, Cleveland, and Denver. Kansas City did not have a one-way video, two-way audio system in place prior to the survey, and reported "0" courses.

## **Data Analysis**

The purposes of the study were to identify the Stages of Concern of the DFAS managers, explore the utility of the Stages of Concern About the Innovation to this population, and draw implications from the expressed concerns of the managers to assist the managers through the change process. This section analyzes the data to accomplish these purposes.

### **Response to the Research Questions**

#### **Stages of Concern**

The responses of the managers who completed section C, Concerns Questionnaire, of the survey instrument (N=341) were analyzed to answer research question Number 1, What are the Stages of Concern of the DFAS managers toward satellite education/training?. The percentile scores for each stage of concern for each respondent were generated from Hall's norming table. The distribution of the highest stage is shown in Table 8 and the group profile of the mean percentile score for each stage in Figure 1.

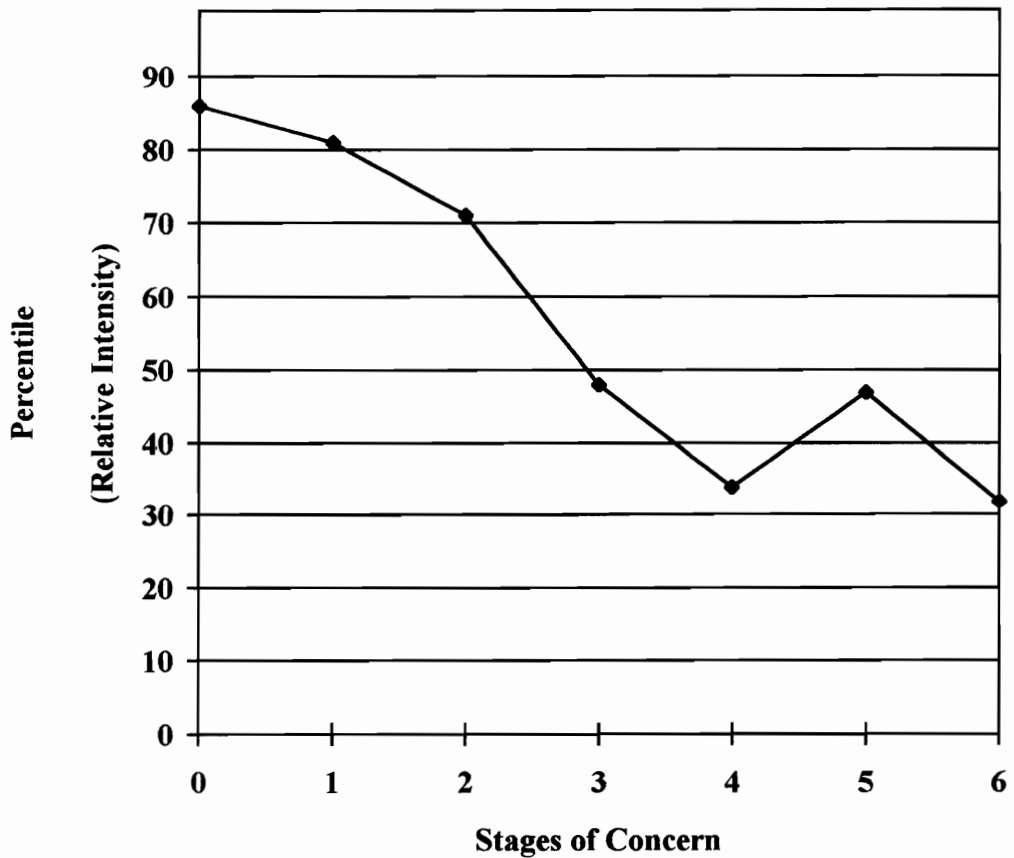
The highest stage for 52% of the population was Stage 0 followed by 28% in Stage 1. From an overall perspective of stage concerns, the group profile typifies Hall's hypothesized "nonuser" profile with higher scores in Stages 0, 1, and 2. High Stage 0, Awareness, for this predominantly "nonuser" group suggests the managers have little cognizance of the innovation. High Stage 1, Informational, indicates a request for

**Table 8**

**Distribution of Highest Stage of Concern for Total Respondents**

Stage	0	1	2	3	4	5	6	Total
Highest SoC								
frequency	179	97	42	5	2	12	4	341
percent	52	28	12	1	1	4	1	100

All percents rounded to nearest whole percent

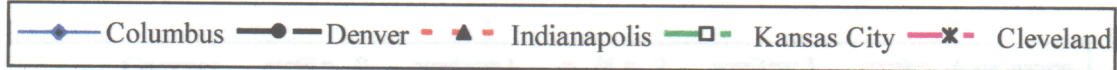
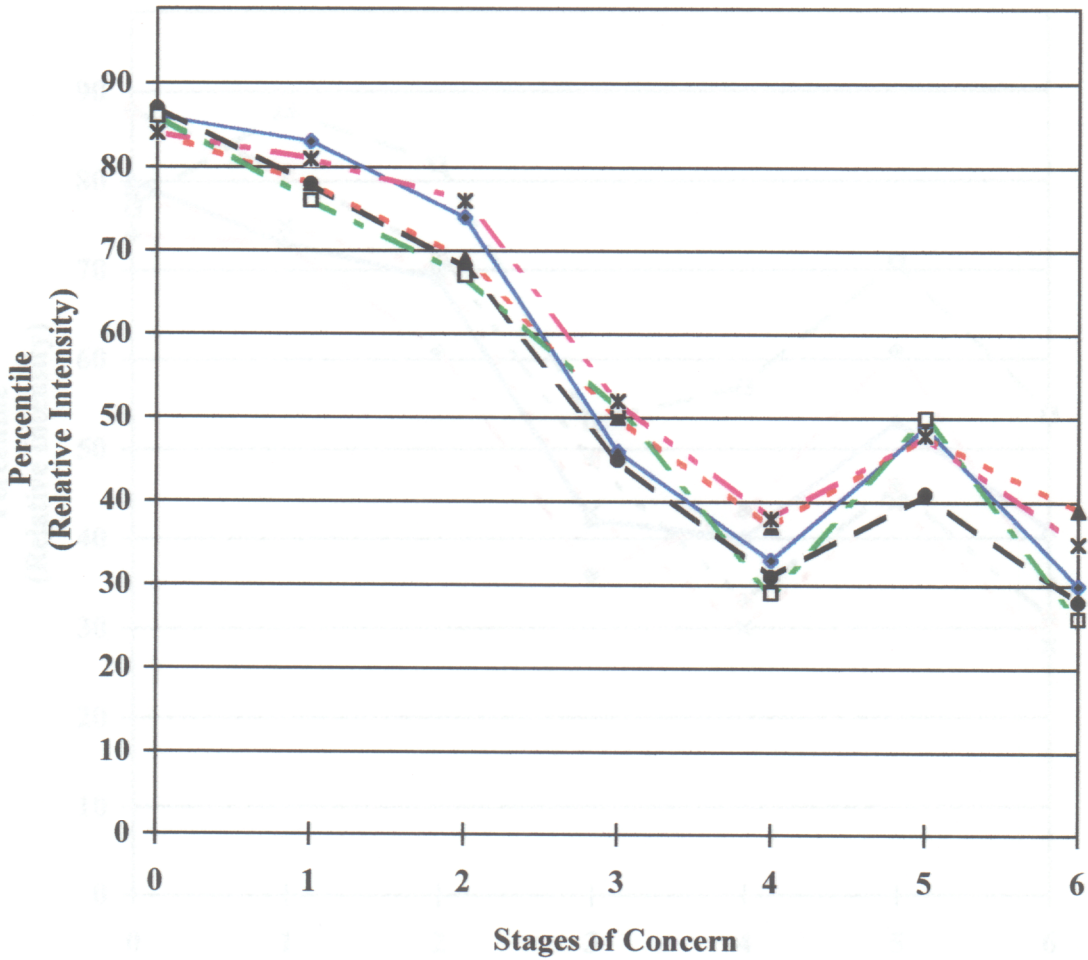


**Figure 1. Stages of Concern Profile for Total Respondents (N=341)**

more information. High Stage 2 suggests Personal concerns and the innovation's consequences for themselves. Additionally, Stage 1 shows relatively more intense concerns than Stage 2 which suggests a positive response toward the innovation. The group does not appear to have intense Management concerns (Stage 3), Consequence (Stage 4) or Collaboration (Stage 5) concerns. The relative intensity of Stage 5 was the highest of the three "impact" stages (Stages 4, 5, and 6). The tailing-off of Stage 6 indicates a lack of resistance toward the innovation or of competing ideas.

Question Number 2, Are the managers' predominant Stages of Concern about satellite education/training independent of Center site, each of which serves one of five DoD organizations (Army, Air Force, Navy, Marine Corps, and Defense Agencies)?, was divided into two parts for data analysis. Question 2a asks, What are the Stages of Concern for each of the five Centers?. The group profiles for each of the five Centers and the distribution of highest Stages of Concern are shown in Figure 2 and Table 9.

The graphic profiles clearly display the predominance of high group mean percentile scores in the earlier stages in each of the Centers. The frequency distribution (Table 9) shows Stage 0 concerns are highest for 52% of the total population, Stage 1 for 28% of the total, and Stage 2 for 12%. High Stage 0 ranged from 44% of the population in the Columbus Center to 62% in the Denver Center. Approximately 1/5 to 1/3 of the respondents from each center expressed highest Stage 1 concerns (Informational). Approximately one-half of the Cleveland Center population was evenly divided between highest Stage 1 and Stage 2 concerns.



Mean Percentile Scores

Center	Stage	0	1	2	3	4	5	6
Columbus		86	83	74	46	33	49	30
Denver		87	78	68	45	31	41	28
Indianapolis		84	78	69	50	37	48	39
Kansas City		86	76	67	51	29	50	26
Cleveland		84	81	76	52	38	48	35

Figure 2. Stages of Concern Center Profiles



**Table 9****Distribution of Highest Stage of Concern Across Centers**

<b>Center</b>	<b>Columbus</b>		<b>Denver</b>		<b>Indianapolis</b>		<b>Kansas City</b>		<b>Cleveland</b>		<b>Total</b>	
	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>
<b>Stage 0</b>	55	44.4	51	62.2	34	60.7	12	60.0	27	45.8	179	52.5
<b>Stage 1</b>	45	36.3	18	22.0	15	26.8	4	20.0	15	25.4	97	28.4
<b>Stage 2</b>	14	11.3	9	11.0	3	5.4	2	10.0	14	23.7	42	12.3
<b>Stage 3</b>	3	2.4			1	1.8			1	1.7	5	1.5
<b>Stage 4</b>			1	1.2	1	1.8					2	0.6
<b>Stage 5</b>	6	4.8	2	2.4	1	1.8	2	10.0	1	1.7	12	3.5
<b>Stage 6</b>	1	0.8	1	1.2	1	1.8			1	1.7	4	1.2
<b>Total</b>	124	36.4	82	24.0	56	16.4	20	5.9	59	17.3	341	100

Chi-square answered question 2b, Are the managers' predominant Stages of Concern about satellite education/training independent of Center site?. The results showed  $\chi^2 = 28.33$ . With 24 degrees of freedom a critical value of 36.42 would be needed to reject the null at .05. Therefore, there was no association between the highest Stages of Concern and Center.

### **Demographic Characteristics and Stages of Concern**

Pearson r determined the answer to question Number 3, Is there a relationship between the managers' predominant Stages of Concern about satellite education/training and the number of employees within the scope of the managers' responsibilities?. The findings showed no relationship,  $r = .06$ . (Appendix G shows the distribution of responses.)

Pearson r correlation was computed with the highest stage and years of federal employment to answer question Number 4, Is there a relationship between the managers' predominant Stages of Concern about satellite education/training and years of employment in the federal government?. The results showed no relationship,  $r = .03$ . (Appendix H shows the distribution of responses.)

Correlational analysis was used to answer question Number 5, Is there a relationship between the managers' predominant Stages of Concern about satellite education/training and years of employment in the financial management career field?. As previously discussed, the profession of several of the DFAS managers was not financial

management. Approximately 93% (N=316) of the respondents who completed the Concerns Questionnaire were financial managers. The findings showed no relationship between each manager's highest Stage of Concern and the number of years of employment in financial management career field,  $r = .03$ . (The distribution of this subset by Center and responses is shown in Appendix I.)

Question Number 6 asks, Is there a relationship between the managers' predominant Stages of Concern about satellite education/training and the number of courses completed by satellite? Table 10 shows the distribution of the respondents who completed the Concerns questionnaire (N=341) by the number of courses completed by satellite per Center. Table 11 shows the frequency of high stages by the number of courses completed. Approximately 16% (n=54) of the respondents completed one or more courses. The range of course completion was 0-19. Eighty-four percent (84%) reported "0" courses. Twenty-six respondents completed 1 course, 17 managers completed 2, 5 managers completed 3, and a total of 6 managers completed 6 or more courses by satellite. Of the 54 managers who completed courses by satellite, only 3 expressed highest stage concerns in the later stages (Stages 4 and 5). This subset was in the group who completed 6 or more courses. Twelve respondents from the no course completion group expressed their highest concerns in stages other than Stage 0, 1, and 2. Correlational analysis showed a weak relationship,  $r = .24$  ( $p < .05$ ), between the managers' highest Stages of Concern and the number of courses completed by satellite.

**Table 10**

**Distribution of Respondents Completing Concerns Questionnaire by Number of Satellite Courses Completed**

<b>Center Courses</b>	<b>Columbus</b>		<b>Denver</b>		<b>Indianapolis</b>		<b>Kansas City</b>		<b>Cleveland</b>		<b>Total</b>	
	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>
<b>0</b>	110	88.7	71	86.6	40	71.4	20	100	46	78.0	287	84.2
<b>1</b>	6	4.8	7	8.5	4	7.1			9	15.3	26	7.6
<b>2</b>	4	3.2	3	3.7	7	12.5			3	5.1	17	5.0
<b>3</b>	2	1.6			2	3.6			1	1.7	5	1.5
<b>6</b>	1	0.8			1	1.8					2	0.6
<b>8</b>					1	1.8					1	0.3
<b>10</b>			1	1.2	1	1.8					2	0.6
<b>19</b>	1	0.8									1	0.3
<b>Total</b>	124	36.4	82	24.0	56	16.4	20	5.9	59	17.3	341	100

**Table 11**

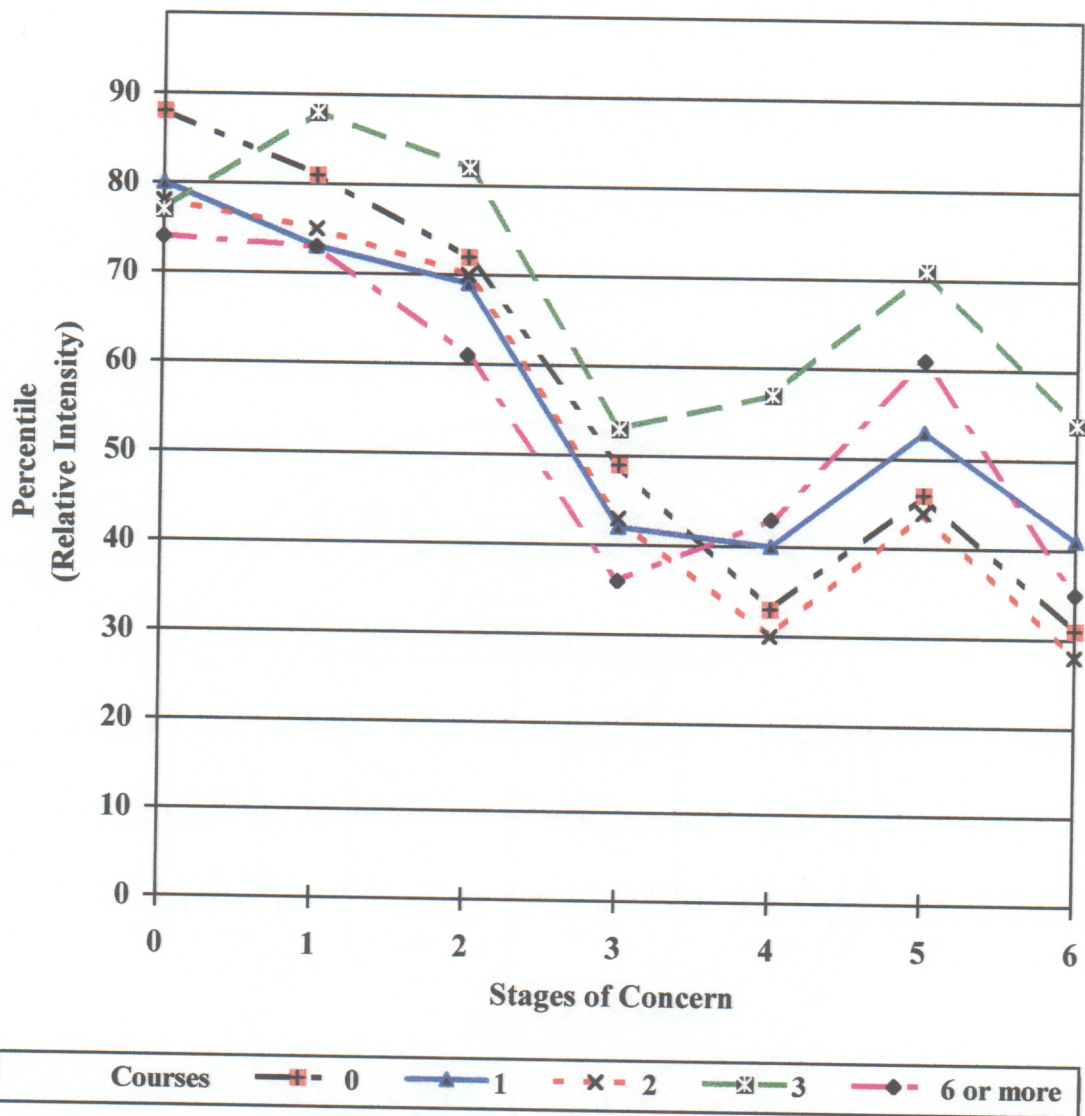
**Courses Completed by Satellite and Highest Stage of Concern**

<b>Courses</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>6</b>	<b>8</b>	<b>10</b>	<b>19</b>
<b>Hi SoC</b>								
<b>0</b>	155	14	7	1	1	0	1	0
<b>1</b>	85	4	5	3	0	0	0	0
<b>2</b>	35	4	1	1	0	0	1	0
<b>3</b>	3	1	1	0	0	0	0	0
<b>4</b>	0	1	0	0	0	1	0	0
<b>5</b>	6	1	3	0	1	0	0	1
<b>6</b>	3	1	0	0	0	0	0	0
<b>Total</b>	<b>287</b>	<b>26</b>	<b>17</b>	<b>5</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>

Group profiles by course completion were generated for graphic comparison (Figure 3). Respondents who completed 6 or more courses (n=6) were placed in one group. Comparison of the group profiles show that although the degree of concern in the earlier stages for those with more experience ( $\geq 6$  courses) is less than the group with no or little experience with the innovation, high Stage 0, 1, and 2 concerns remain prominent in all groups. The 0, 1, and 2 Stage order of relative intensity was observed in all groups with the exception of the 3 course completion group. This group expressed highest Stage 1 concerns. Additionally, the 6 or more courses completion group had nearly equal Stage 0 and Stage 1 relative intensity mean group percentile scores (74% and 73% respectively). Possible suggestions for this lack of movement of the more experienced groups is discussed in a later section.

### **Summary of the Analysis**

The responses of the 341 managers who completed the Concerns Questionnaire, section C of the survey instrument, were used for data analysis. Stages of Concern graphic profiles of the total population and of the five DFAS Centers were generated and showed similar, "nonuser" patterns with highest Stage 0 scores, followed by a high relative intensity in Stages 1 and 2, respectively. The results of Chi-square findings concurred with the graphic observations and showed no association between the highest Stages of Concern and the five DFAS Centers.



Mean Percentile Scores

Stage	0	1	2	3	4	5	6
Courses 0	88	81	72	49	33	46	31
1	80	73	69	42	40	53	41
2	78	75	70	43	30	44	28
3	77	88	82	53	57	71	54
6 or more	74	73	61	36	43	61	35

Figure 3. SoC Profiles of Levels of Experience with Satellite Courses

Correlational analysis showed no relationship between the highest Stages of Concern and the demographic variables of years of employment either in the federal government or the financial management career field. Likewise, there was no relationship between the highest Stages of Concern and the number of employees within the managers' scope of responsibility. Although unremarkable, a weak relationship was found between experience level with satellite education and training and highest stage concerns. Graphic Stages of Concern profiles also showed little movement from the highest relative intensity scores in Stage 0, 1 and 2 toward the "task" (Stage 3) or "impact" (Stages 4, 5, and 6) stages. This lack of movement was somewhat surprising.

### **Responses to the Open-Ended Statement**

Section B of the questionnaire asks, "When you think about satellite education/training for DFAS employees, what are you concerned about?". Eighty-two percent of the managers (N=305) responded to this question. The comments were sorted as categories were identified. Three primary categories emerged, i.e. "Questions", "Concerns", and, "Other" which included: favorable; unfavorable; and "no concerns" statements. Several subcategories emanated from the Questions and Concerns categories. One of the subcategories focused on the medium of satellite and the other on the training and education programs. The Concerns category required an additional subgroup which related to general management issues. The number of responses per category and



subcategory were tallied for each Center and by course completion groups. The findings are discussed in following section.

### **Center Responses** (Table 12)

#### **Columbus**

A total of 169 comments were provided by the 112 respondents from the Columbus Center. Thirty-six percent of the responses fell into the Questions category. Twenty-six percent of the questions pertained to the medium of satellite and ranged from general informational questions such as what it is, how it works, and who has access, to questions about the cost benefits of the method. The remaining 10% were inquiries regarding the type of programs that would be offered and how the “functional” training (e.g. accounting and budgeting) would be handled. Additional questions asked about class registration, course availability, course catalogues, and college credit. Questions of evaluation included: method, feedback to supervisors regarding the employees’ progress, and the cost/benefits of the training.

More than one-half of the responses in the Concerns category were statements about the medium of satellite. Of this group nine comments expressed concerns about satellite transmission, especially the video quality, and staff to support the medium, i.e. technicians and classroom facilitators. However, the largest percentage of this group expressed concern about potential problems with communication between student and instructor and student peers. These concerns ranged from the ability of the students to ask

**Table 12**

**Responses from DFAS Managers about Satellite Education/Training**

CENTER	Columbus		Denver		Indianapolis		Kansas City		Cleveland	
	N	%	N	%	N	%	N	%	N	%
<b>QUESTIONS</b>	<b>60</b>	<b>36</b>	<b>24</b>	<b>24</b>	<b>24</b>	<b>30</b>	<b>11</b>	<b>37</b>	<b>25</b>	<b>36</b>
<b>• MEDIUM</b>	<b>44</b>	<b>26</b>	<b>26</b>	<b>17</b>	<b>10</b>	<b>13</b>	<b>6</b>	<b>20</b>	<b>19</b>	<b>28</b>
- What is it?	27		12		5		3		11	
- cost/benefit	11		2		2		2		4	
- accessibility	6		3		3		1		4	
<b>• PROGRAM</b>	<b>16</b>	<b>9</b>	<b>7</b>	<b>7</b>	<b>14</b>	<b>18</b>	<b>5</b>	<b>17</b>	<b>6</b>	<b>9</b>
- courses	6		3		5		2		3	
- schedules	1		2		4				1	
- cost/benefits	4		2		2		1		2	
- evaluation	5				3		2			
<b>CONCERNS</b>	<b>89</b>	<b>53</b>	<b>68</b>	<b>68</b>	<b>49</b>	<b>62</b>	<b>16</b>	<b>53</b>	<b>36</b>	<b>52</b>
<b>• MEDIUM</b>	<b>57</b>	<b>34</b>	<b>29</b>	<b>29</b>	<b>20</b>	<b>25</b>	<b>5</b>	<b>17</b>	<b>14</b>	<b>20</b>
- transmission	9		8		4		2		2	
- interaction	28		15		14		3		9	
- learning effects	14		5						2	
- acceptance	6		1		2				1	
<b>• PROGRAM</b>	<b>26</b>	<b>15</b>	<b>32</b>	<b>32</b>	<b>23</b>	<b>29</b>	<b>7</b>	<b>23</b>	<b>18</b>	<b>26</b>
- Content										
• subjects	2		6		4		3		1	
• job related	2		6		5				6	
• DFAS related	5		4		4		1		3	
• materials			2		2				1	
• benefits			3		3		1		3	
- Other										
• time frames	4		3		2				1	
• instructor	2		1		2		1			
• quality	11		7		1		1		3	
<b>• MANAGEMENT</b>	<b>6</b>	<b>4</b>	<b>7</b>	<b>7</b>	<b>6</b>	<b>8</b>	<b>4</b>	<b>13</b>	<b>4</b>	<b>6</b>
- scheduling	1		2		2		1		2	
- employee time	3		5		4		3		2	
- role	2									
<b>OTHER</b>	<b>20</b>	<b>12</b>	<b>8</b>	<b>8</b>	<b>6</b>	<b>8</b>	<b>3</b>	<b>10</b>	<b>8</b>	<b>12</b>
favorable	14		3		5		2		3	
unfavorable	2		1							
no concerns	4		4		1		1		5	
<b>Total Comments</b>	169		100		79		30		69	
<b>Total Respondents</b>	112		64		53		20		56	

All percents rounded to nearest whole percent

questions (including the hearing impaired) to the instructor's ability to pace material, as required for effective learning. Several managers suggested that unlike the traditional classroom, lack of interaction through the satellite medium could decrease student comprehension and attention span. Additionally, six respondents were concerned that employees may not readily accept this change, as it differed from their traditional methods of training.

Approximately 15% of the comments from the Columbus managers were concerns about programs. These concerns addressed "quality" of the content, its relevance to specific job tasks, their respective operation, and the mission of DFAS. Only 4% of the comments addressed general management concerns about scheduling employees and time constraints for training. Two respondents were concerned about how the training might impact their role as manager.

Thirteen percent (13%) of the managers responded favorably toward the innovation. These statements included: "A Good idea taking the classroom to the student"; "Need better way to train than what we have now"; "Sounds cost effective"; and "Looking forward to it".

## **Denver**

The 64 respondents from Denver offered 100 comments, including three which addressed favorable benefits of the innovation. One-fourth of the comments were questions, similar to those of Columbus, which addressed both medium and programs.

The lack of information was highlighted.

Sixty-eight percent (68%) of the comments were concerns. Although Columbus had nearly twice as many concerns about medium than program, Denver was nearly evenly divided between the two areas. Denver's primary concern with respect to medium was the lack of interaction between the student and instructor and the lack of opportunity to ask questions. These issues filtered into concerns about the potential of a decrease in learning effectiveness for the students. One respondent was concerned that this medium may not be the best method to train either the older adult, or one that required individual attention.

Although there were only a few informational inquires about programs (n=7), 32% of the total comments concentrated on Concerns about programs. The relevance of program content to the DFAS organization in general, and to the Denver Center specifically, was clearly expressed. The program concerns focused on the overall "quality", the subjects that would be taught, and their pertinence to specific jobs.

Time was an issue in several respects. One was that the inflexibility of broadcast schedules may not be conducive to Denver's time zone, or may be incompatible with the employees' work schedule. Program length was also a concern. Another concern was from a management perspective of time constraints for training versus heavy workloads, which led to concerns about the impact of insufficient time to attend training and the consequences of this on the employee.

## **Indianapolis**

The Indianapolis Center provided 79 comments. Thirty percent (30%) were the general information inquiries. Once again, questions regarding how the training would be evaluated were asked. Five comments were highly favorable about satellite training and/or the needed training it would provide, however, more than one-half (54%) of the total comments were medium and programmatic concerns.

With respect to medium, the lack of interaction was again the primary issue. Comments ranged from the inability of the instructor to communicate with the student to the limited opportunity for questions because of the potentially large number of locations and attendees the system could concurrently service. The comments suggested that this communication gap could render the method “impersonal” which could lead to classroom “boredom”. Two respondents commented that the change in method of training may not be readily accepted. Additionally, concerns about the quality of the transmission, especially video, were similar to those expressed by the other Centers.

Twenty-nine percent (29%) of the comments were program concerns. The overall contention was that subject matter would be limited and “canned” courses would be offered that would not integrate with the mission of DFAS, or, more specifically, would not address the training needs of specific jobs.

Questions and concerns about time were not unlike those of the other Centers. These included: employee time away from the job; advance notice of program times for scheduling employees; and the time of day programs would be offered.

## **Kansas City**

The respondents from the Kansas City Center (N=20) offered 30 comments. Two were highly favorable, 37% were questions seeking the same information as the other Centers, and more than one-half of the comments (53%) fell into the category of Concerns.

Seventeen percent (17%) expressed the previously discussed concerns about medium. In addition to potential transmission problems and the lack of interaction, the Kansas City managers expressed concerns about response delays related to answering questions and concerns about the lack of individual attention. In the program concerns category (23%), the primary focus was on course content. Specifically, the concerns were that the courses may not be coordinated into a planned, meaningful career “track” curriculum and may not be germane to the mission of DFAS. Additionally, issues regarding time constraints of work versus training were similar to the other Centers.

## **Cleveland**

Sixty-nine comments were offered by the 56 respondents from Cleveland. The greatest percent of the questions were requests for general information about the medium, none of which differed from the other Centers. Program concerns (26%) slightly outweighed those about the medium (20%). The managers were concerned about the overall “quality” and “effectiveness” of the programs and that course offerings may not be job or mission relevant, i.e. not cost effective from an organizational level and of little

value to the individual employee.

Concerns about medium were similar to those of the other centers, i.e. the lack of interaction and face to face communication, and the potential negative effects this could have on learning. Additionally, the same comment regarding accommodations for the hearing impaired that was offered by the Columbus Center was expressed by a manager from Cleveland.

### **Responses by Course Completion**

Forty managers who completed courses by satellite provided a total of 57 responses to the concerns question in section B. As shown in Table 13, the managers had few questions. Concerns about medium and program were the most prevalent. With respect to the medium, concern about employee acceptance of the new method was expressed by three respondents. Concerns regarding the loss of the traditional classroom environment, loss of the presence of an instructor, and lack of overall interaction was highlighted in all the groups. The ability to ask questions and the assurance that questions would be answered was the most emphasized concern in this category. Quality of the broadcast, especially picture quality, was a concern expressed by 4 respondents.

Comments in the program concerns category included concerns about whether the training would be beneficial, relevant to jobs, the work environment, and the mission of DFAS. These comments suggest that the course completers were not aware of what courses would be offered by satellite. The following comment expressed by one of the

**Table 13**

**Responses from Course Completers about Satellite Education/Training**

COURSES COMPLETED	1		2		3		≥ 6	
	N	%	N	%	N	%	N	%
<b>QUESTIONS</b>	<b>1</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>13</b>	<b>0</b>	<b>0</b>
<b>• MEDIUM</b>	1	5			1	13		
- What is it?								
- cost/benefit	1							
- accessibility					1			
<b>• PROGRAM</b>								
- courses								
- schedules								
- cost/benefits								
- evaluation								
<b>CONCERNS</b>	<b>16</b>	<b>80</b>	<b>18</b>	<b>95</b>	<b>7</b>	<b>88</b>	<b>7</b>	<b>70</b>
<b>• MEDIUM</b>	7	35	9	47	2	25	3	40
- transmission			2		1		1	
- interaction	7		4		1		2	
- learning effects			1					
- acceptance			2				1	
<b>• PROGRAM</b>	9	45	7	37	5	63	3	30
- Content								
• subjects			1		1		1	
• job related	4		1		1			
• DFAS related	1		2		1		1	
• materials	1		2					
• benefits	1							
- Other								
• time frames	1				2			
• instructor							1	
• quality	1		1					
<b>• MANAGEMENT</b>			2	11				
- scheduling								
- employee time								
- role			2					
<b>OTHER</b>	<b>3</b>	<b>15</b>	<b>1</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>30</b>
favorable	1		1				2	
unfavorable							1	
no concerns	2							
<b>Total Comments</b>	20		19		8		10	
<b>Total Respondents</b>	17		12		5		6	

All percents rounded to nearest whole percent



managers supports this assumption. "I would hope that from a strategic viewpoint, that we would hold to the acquisition of the broadest range of courses available." Concerns about courses, therefore, may be competing with the concerns about the medium, as was also indicated in each of the Centers.

### **Post Hoc Investigation**

The managers' written comments either requested or indicated a need for more information. Therefore, a closer examination of the SoC stage scores seemed prudent. Since Stage 0 was the most prevalent highest Stage throughout the manager population, is difficult to interpret, and offers little useful information with this population, the second highest stage of the highest Stage 0 population was investigated. The findings showed approximately 70% (n=125) of the 179 managers who expressed highest Stage 0 scores also expressed second highest scores in Stage 1, Informational concerns. The need for more information, therefore, was clearly expressed throughout the SoC profiles and written comments.

Of the remaining 30% in the highest Stage 0 group, 18% (n=32) expressed second highest Stage 2 concerns. A higher relative intensity of Stage 2 than that of Stage 1, termed a "negative one/two split" suggests "... various degrees of doubt and potential resistance to the innovation" (Hall, et al., 1986, p. 36). However, only a few of the managers provided responses that were clearly negative about the innovation.

## Summary of Results

The Stages of Concern for the DFAS managers (N=341) collectively and by each of the five DFAS Centers were identified by a modified version of the SoC Questionnaire and the use of the original SoC norms. The findings showed that the total group of respondents and each of the five Centers had typical, “nonuser” Stages of Concern profiles. These findings concurred with the responses of 84% (n=287) of the managers who indicated they had not completed any courses by satellite. With the exception of the Kansas City Center, all Centers had some experience with the innovation. Chi-square findings showed there was no association between highest Stages of Concern and Center.

Employment profiles of the respondents showed a range from 1 to more than 25 years in both federal employment and experience in the financial management career field. Managerial responsibility by the number of employees ranged from 1 to 8,500. Correlational analysis showed no relationship between the managers’ predominant Stages of Concern and these demographic variables.

The range of course completion by satellite was 0 to 19. Approximately 16% (n=54) of the respondents who completed the Concerns Questionnaire completed 1 or more courses by satellite. Correlational analysis showed a weak relationship between the predominant Stages of Concern and the amount of experience with satellite.

Five groups were determined by the number of courses completed by satellite, i.e. 0, 1, 2, 3, and 6 or more courses. Stages of Concern profiles for each of the five course

completion groups were generated for graphic comparison. The observations from the graphic profiles appeared to parallel the statistical findings. Although variations in the relative intensity in the earlier stages were observed by the group mean stage scores, Stages 0, 1, and 2 remained the most prominent for each of the groups. The exception to the 0, 1, and 2 Stage order of relative intensity was observed in the 3 course completion group which expressed highest Stage 1 concerns, followed by Stage 2 and 0 concerns. Also noted was the 6 or more courses completion group had nearly equal Stage 0 (74%) and Stage 1 (73%) scores.

Explanation for little movement through the stages by the more experienced groups was investigated by examining the responses to the open-ended question, “When you think about satellite education/training for DFAS employees, what are you concerned about?”. The findings showed the course completion groups had concerns about both the medium of satellite and concerns about the programs that would be delivered by the medium. This finding suggests that concerns about programs may be competing with concerns about the medium of satellite.

A post hoc investigation of the SoC profiles of the 179 managers with highest Stage 0 scores showed that approximately 70% (n=125) of this group expressed second highest scores in Stage 1. Eighteen percent (18%) expressed second highest scores in Stage 2. This finding provided additional support for the conclusions and recommendations discussed in the following chapter.

## **CHAPTER 5**

### **SUMMARY, CONCLUSIONS, and RECOMMENDATIONS**

This chapter is divided into five sections. The first section is a summary of the background, design, and results of the study. The second and third sections discuss the conclusions and implications that are based on the findings of the research. The final sections include recommendations for DFAS which bridge the interpretation of the findings with practical applications and concludes with recommendations for further research.

#### **Summary**

Due to reductions in the federal budget, DFAS is experiencing many changes, one of which is a change from their traditional methods of teaching and learning to satellite education and training. This study was designed to identify the concerns of the DFAS civilian managers employed in the five DFAS Centers about this change. The theoretical foundation of the study was Stages of Concern about the Innovation, one dimension of the Concerns-Based Adoption Model conceptualized by Hall, Wallace, and Dossett (1973). As discussed in Chapter 1, the SoC has infrequently been extended to populations outside of education. This study explored the utility of the SoC for a population that differs from previous research.

The 6 research questions guiding the study were answered and are summarized in the following three questions.

1. What are the Stages of Concern of the DFAS managers toward satellite education/training?
2. Are the managers' predominant Stages of Concern independent of Center site?
3. Is there a relationship between the managers' predominant Stages of Concern and the number of employees within the managers' scope of responsibility, years of employment in the federal government, years of employment in the financial management career field, and courses completed by satellite?

Concerns were further explored by examining the comments from the Open-Ended Statement of Concern About an Innovation, "When you think about satellite education/training for DFAS employees, what are you concerned about?". Details of the data analysis are provided in Chapter 4.

The study population was 726 individuals who were identified by a data base obtained from DFAS as the total population of civilian managers employed at the five DFAS Centers. However, this population was later reduced to 668 managers, as 58 potential respondents were no longer employed as a manager at a DFAS Center.

The instrument used for the study, the "Satellite Education and Training Survey", was a simple, modified version of the original SoC Questionnaire and the Open-Ended Statement of Concern About an Innovation. Two mailings of the questionnaire resulted in a response rate of 55% (N=370), which was based on the known, available population of

managers at the DFAS Centers (N=668). The response rate from the Centers ranged from 37% (Kansas City) to 61% (Denver). Ninety-two percent (N=341) of the respondents completed the Concerns Questionnaire, section C of the instrument, and 82% (N=305) answered the Open-Ended Statement in section B.

The analysis included both group level data and individual level data. The variables of age, gender, racial/ethnic background, and educational level were used to describe the population. The Stages of Concern were determined by the percentile scores based on the original SoCQ norming table (Hall, et al.,1986). Pearson r was used to determine if there was a correlation between the highest stage of concern for each respondent and the variables: years of federal employment; years of employment in the financial management career field; number of employees within the managers' scope of responsibility; and number of courses completed by satellite. Chi-square was used to determine if there was an association between the highest stage of concern and Center site.

Responses from the Open-Ended Statement, "When you think about Satellite Education/Training for DFAS employees, what are you concerned about?" were sorted by Center and by course completion groups 1, 2, 3, and 6 or more. The comments fell into three primary categories: Questions; Concerns; and Other. The "Questions" category was subdivided into questions about medium and questions about programs. The "Concerns" category was divided into concerns about the medium, concerns about programs, and general management concerns. The "Other" category included favorable, unfavorable, and

"no concerns" statements. The comments were tallied and percentages generated for each category.

The principal findings of the study showed that the population was predominantly comprised of a group of "nonusers" of satellite education and training. Observations made from the SoC profile of the total group typified a positive response of a "nonuser" with higher scores in Stages 0, followed by Stages 1 and 2, and the tailing-off of Stage 6. Highest Stage 0 scores accounted for approximately 52% of the population, highest Stage 1, 28% and highest Stage 2, 12%. Highest Stage 0 (Awareness) suggested the managers had little knowledge or no concerns about satellite education and training. High Stage 1 (Informational) indicated a request for more information. Higher Stage 1 than Stage 2 suggested a positive response toward the innovation. The group did not appear to have intense "task" concerns, that is, Management concerns (Stage 3). Likewise, the group did not appear to have intense "impact" concerns (Stages 4, 5, and 6). The tailing-off of Stage 6 indicated a lack of resistance toward the innovation or of competing ideas. However, with respect to the "impact" concerns, the group had a higher Stage 5 (Collaboration) percentile score compared to Stages 4 and 6. Each of the Center profiles had similar SoC patterns.

Chi-square results showed no association between the managers' highest Stages of Concern and the Centers. Furthermore, correlational analysis showed no relationships between the highest Stages of Concern and the demographic variables of years of

employment either in the federal government or the financial management career field, or the number of employees in the scope of the managers' responsibilities.

A relationship between experience with the innovation and highest stage was explored. Course completion ranged from 0 to 19. Fifty-four (16%) of the managers reported completing one or more courses by satellite. Correlational analysis between the highest SoC and the number of courses completed by satellite showed a weak relationship,  $r = .24$ . Further, graphic comparisons of the SoC profiles of five course completion groups, i.e. 0, 1, 2, 3, and 6 or more courses showed that the course completion groups 0, 1, 2, and 6 expressed highest scores in Stage 0, followed in relative intensity by Stages 1 and 2. The SoC profile of the course completion group 3 was the exception to this pattern. The highest stage for this group was Stage 1 followed by second highest Stage 2. Additionally, the 6 or more course completion group showed nearly equal percentile scores in Stage 0 (74%) and Stage 1 (73%). Therefore, although some movement was observed in the more experienced groups, the observable differences between the groups were negligible.

Responses to the open-ended statement provided specific concerns and offered additional insight to the statistical analysis and the observations from the SoC profiles. Approximately 1/4 to 1/3 of the comments from each of the five Centers were questions about the medium of satellite and the programs satellite would deliver. Each Center had similar questions. These questions ranged from inquiries about what satellite education/training was, how it works, and who has access, to questions about the cost



benefits of the medium. Questions about the programs satellite would deliver included those regarding the type of course offerings, course schedules and registration, method of course evaluation, feedback to the managers' of their employees' progress, and cost/benefits of the training. Additionally, several respondents requested more information about satellite education/training.

More than 50% of the comments from each Center were concerns. The most prominent concern throughout focused on the potential lack of communication between instructor and the students and between the students. This highlighted concern filtered into concerns about the lack of opportunity to ask and answer questions and limited opportunity to communicate because of the vast number of locations the satellite system could concurrently reach. Other concerns about the medium included the possible decrease in the effectiveness of the training, decrease in the students' attention span, and lack of individual attention.

Other concerns included those of "Programs" and "Management". The primary concerns about "Programs" concentrated on the potential that the courses would not be job specific or germane to the mission of DFAS. This led to the cost/benefits concerns of the training. The primary general management concerns addressed time constraints for training versus heavy workloads and scheduling employees for training.

The findings from the course completion groups (1, 2, 3, and 6 or more courses) showed the groups asked few "Questions" about the medium and programs. Their comments focused on "Concerns" about the medium of satellite and of the programs

delivered by satellite. The findings from each Center and course completion group indicated concerns about medium were competing with concerns about programs.

Requests for, or indications of, the need for additional information prevailed throughout the written comments. Based on these findings, the second highest SoC of the 179 respondents with highest Stage 0 scores was examined. This investigation showed that approximately 70% (n=125) of this group expressed second highest scores in Stage 1, Informational concerns. The need for more information seemed apparent. The post hoc investigation also revealed that 18% (n=32) of the highest Stage 0 group had second highest Stage 2 (Personal) concerns. Although this "negative one/two split" indicates that personal concerns with respect to the innovation outweigh the desire for more information and suggest doubt or potential negativity about the innovation, few (n=3) of the managers clearly expressed unfavorable comments about satellite education and training.

## **Conclusions**

The first purpose of the study was achieved. The Stages of Concern of the DFAS managers were identified. The findings from a modified SoC Questionnaire, the Satellite Education and Training Survey, with the use of the original SoCQ norms and the Open-Ended Statement of Concern about an Innovation accomplished this purpose.

Observations from the SoC profiles showed the managers were a predominantly "nonuser" group with a positive response toward the innovation. The demographic

information with respect to little or no experience with satellite training concurred with the findings from the SoC profiles. Written comments from the open-ended statement increased the confidence in the findings from the SoC profiles. This study, therefore, demonstrated the effectiveness of simple modifications of the original SoC Questionnaire and use of the original norms. The open-ended statement provided additional support to demonstrate the effectiveness of this method.

Several researchers have developed instruments to capture the theoretical constructs of the SoC and corresponding norms to score the instrument for different populations (Kolb, 1983; Martin, 1989; Barucky, 1984; Jordan-Marsh, 1985). This study is only one of two (see Bernier, 1990) that demonstrated the effectiveness of the original instrument with simple modifications of the same nine questionnaire items (Appendix E) and use of the original norms with a DoD population.

The second purpose of the study, to explore the utility of the Stages of Concern to this population, was partially achieved through the accomplishment of the first purpose and is further demonstrated by comparing the findings of this study to that of previous SoC research. Parallel findings were observed between stage concerns and demographic characteristics of the DFAS managers and the populations of previous studies.

The findings from this study support those of Hall, George, and Rutherford's (1986, p. 52) research with teachers with respect to no "outstanding relationships between standard demographic variables and concerns data". This study found no relationship

between highest stage of the DFAS managers and years of employment in the federal government and experience in the financial management career field.

Hall et al.'s (1986) research supported the hypothesis that rather than the standard demographic variables, the critical element in gaining an understanding of concerns is in identifying the "state of the user system" and the interrelationships between the environmental conditions and interventions used to implement the innovation. With respect to environmental conditions, it was anticipated that differences may be observed as the Centers differed by the culture of the agency or organization each served. However, the findings showed the Centers expressed similar concerns. Culture did not appear to influence the climate or the attitudes of the managers, as each Center had similar concerns and SoC profiles. This finding reinforces the discussion in Chapter 2 that organizational culture (Schein, 1988) and climate (Trice, 1993) are two distinct constructs.

The changes regarding the ongoing DFAS reorganization and restructuring, vis-a-vis the instability of job security throughout DFAS, might have made the Centers more similar than different. The "state of the user system" was one which was facing major organizational changes. As downsizing continues, the concern about the potential loss of job could realistically surpass a concern about a change in training.

Based on the findings that information about the innovation was needed, and in some instances requested, questions arise about the prior methods used to inform the managers about satellite education and training. These methods were either lacking or

failed to attain the objective. The need for more information about the change was clearly indicated throughout the managers' responses.

Another question the study was designed to explore was the possibility of a relationship between concerns and management responsibility, which was defined by the number of employees the manager directly supervised and the number of employees reporting to the respondent's subordinate supervisors. It was assumed that those with greater responsibility, that is, responsible for a greater number of employees, would have more knowledge about satellite education and training. Although the results did not support this hypothesis, an interesting observation was made with the DFAS manager population. Of the three "impact" stages, Stage 5 (Collaboration) peaked in all the SoC profiles that were generated for the study. This finding suggests that the managers had some concerns about working with and collaborating with others with respect to the innovation. As "collaboration" is a function of management, this observation of the DFAS managers would be anticipated when the SoC constructs are functioning. Additionally, Hall confirmed that the Stage 5 scores of this study population is what would be expected (personal conversation on 10/1/96).

The findings from this study with respect to "no outstanding relationships between standard demographic variables and concerns data" supports SoC's "cycles of experience with the innovation" and highest stage (Hall, et al., 1986, p. 52). Although a shifting toward the "impact" concerns (Stages 4, 5, and 6) was anticipated in the groups more experienced with the satellite medium, i.e. those who have taken more courses, there is a

possible explanation that can account for this lack of movement. As previously discussed, written comments identified competing concerns between the medium of satellite and the programs the medium would deliver. Concerns about the programs and the medium were clearly stated in each course completion group. An explanation that can account for concerns about programs rather than the innovation of satellite medium is the respondents who had experience with PictureTel, the DFAS land-line videoteleconferencing system, may have considered PictureTel and the new satellite system similar enough that they had few concerns about medium and focused their concerns on programs. Therefore, it would be expected that the SoC profiles of the respondents who were concerned about the "programs" the medium would deliver would reflect that of the "nonuser" in the context of the "cycles of experience with the innovation".

The third purpose of the study was to draw implications from the findings to determine appropriate interventions to assist the managers through the change process. These implications are discussed in the following section and are followed by recommended interventions.

## **Implications**

The SoC profiles for the total population and for each of the five Centers showed highest scores at Stage 0 followed by Stage 1 and 2. As the demographic profiles of the respondents identified the group as predominantly "nonusers" of the innovation, highest

Stage 0 scores indicated the groups had little knowledge, concern, or interest about the innovation. Written statements from several respondents supported the indication that highest Stage 0 implied little knowledge. Examples that clearly expressed this lack of knowledge are: "This survey is the first I've heard of this technology."; "I don't know anything about the subject."; and "...What is it?". The survey, therefore, might have been a serendipitous intervention which aroused concerns in the earlier stages, that is, aroused Awareness, Informational, and Personal concerns.

Stage 1(Informational) concerns was the second highest Stage of Concern in the SoC profiles. Twenty-eight percent (n=97) of the population who completed the concerns questionnaire expressed highest Stage 1 concerns and 125 managers with highest Stage 0 expressed second highest Stage 1 concerns. Therefore, of the 341 respondents, 65% (n=222) of the population expressed intense Informational concerns which indicates the desire for more information. This indication was supported in the written comments. Approximately 1/3 of the comments were questions seeking more information about the medium and programs. Further, none of the managers either stated or suggested they did not want any additional information; rather several managers provided their names and phone numbers requesting more information. Additionally, most of the comments that were categorized "Concerns" indicated a lack of general knowledge and the need for more information. The need for more information, therefore, appeared to be the focus throughout the findings.

Hall (1979) proposes interventions that are "...*hypothesized* to be relevant for each stage..." (p. 204). For Stage 1, he suggests the focus of the interventions is on providing "very general descriptive information" (p. 205). He offers five types of interventions that may be appropriate. These include:

- a. Information dissemination through "conversation", "brochures", or "short media presentations";
- b. Information which contrasts "what the individual is presently doing with what use of the innovation would entail";
- c. Visit sites that are using the innovation;
- d. "Express a great deal of enthusiasm and involve others who are excited about what they have been doing with the innovation"; and
- e. Identify anticipated cost/benefits of the innovation.

Hall et al. (1986, p. 54) defines individuals with high Stage 2 as those who "have intense personal concerns about the innovation and its consequences for them".

Approximately 12% (n=42) of the population expressed highest Stage 2 (Personal) concerns. High Stage 2 often suggests that the individual views the innovation as a "personal threat" and may also imply (in reference to teachers) "that some other aspect of school or personal life is causing a great deal of personal discomfort and uncertainty" (Hall, 1979, p. 206). Based on Hall's statement, high Stage 2 for the DFAS managers could be related to the many changes DFAS is now facing, especially job insecurity.



Twelve percent (n=42) of the respondents expressed highest Stage 2 (Personal) concerns and 32 respondents from the highest Stage 0 group expressed second highest Stage 2 scores. When Stage 2 is equal to or greater than Stage 1, this is termed a "negative one/two split" (Hall et al., 1986) and suggests the potential for resistance toward or doubt about the innovation. However, few managers from the "negative one/two split" group clearly demonstrated negativity or doubt from a personal perspective. Two of the more obvious Personal concerns from this group were (I am concerned about) "...whether training is germane to issues/problems facing my area; how training will improve or enhance my effectiveness as a supervisor" and " ...how can this training be applied on my job at this time and how will it aid in furthering my promotion potential." Of all the written comments from this group, these were the most obvious examples of Personal (Stage 2) concerns. These comments suggest concern about personal consequences of the training. Although the statements imply some potential doubt about the innovation, negativity about the innovation is not clearly indicated. As these were the best examples from this Stage 2 concern population, intense negativity toward the innovation seems unlikely from individuals in this category.

Additionally, based on some of the written responses, it can be assumed that the foundation of some potential negativity may stem from the fact that the managers were not personally informed about the change. Examples of these comments are: "Have never heard about this particular subject before. I guess my concern is - How can someone ask

me to answer questions on a subject I know nothing about...?" and "I only know what has been stated in this survey."

Hall et al. (1986) suggest that interventions to reduce the intensity of highest Stage 2 concerns take precedence to addressing Informational concerns, as the individual has a greater concern of a personal nature related to the innovation than learning more about the innovation itself. Further, Hall (1979, p.6) states "Clearly, change facilitators need to be very careful in working with persons who have intense personal concerns."

Hall's (1979, p. 206) suggestions for Stage 2 interventions are:

- a. Offer encouragement and "assurance of personal adequacy";
- b. "Encourage innovation use gingerly...";
- c. Explain the relationship between the innovation and other demands that may be potential conflicts in terms of personal energy and time constraints;
- d. Demonstrate a gradual introduction to the innovation and set realistic expectations;
- e. "Provide personal support... and assistance in the use of the innovation"; and
- f. "Legitimize the expression of personal concerns".

These suggested interventions are the foundation of the recommendations provided for DFAS.

## **Recommendations for DFAS**

Research has shown that interventions which specifically address the intense Stages of Concern help reduce the intensity of those stages, and thereby, facilitate movement toward the "impact stages". The following discussion offers recommendations to help ensure a smooth transition toward the adoption of satellite training. Specifically, these recommendations focus on Stage 1 (Informational) concerns, as these were the most prevalent throughout the findings. Recommendations are also included for Stage 2 (Personal) concerns. Stage 0 was not included. All of the managers who are employed at the DFAS Centers have been made "aware" of the innovation by the survey instrument and accompanying letter.

The following interventions are targeted for the total study population of DFAS managers, rather than individuals, as this approach is the most feasible and practical for DFAS. Additionally, as concerns about programs and the medium of satellite appeared to be concurrently operating, the recommendations address both areas of concern when appropriate. The following recommendations apply to each of the DFAS Centers. All recommendations are based on the interventions as suggested by Hall (1979) and address the written comments provided by the respondents.

Stage 1 (Informational) concerns indicate a desire for more information. The desire for and need of more information was also clearly expressed in the written comments. Hall (1979, p. 205) suggests providing "very general descriptive information"

to address this Stage of Concern. The five interventions suggested by Hall seem appropriate for DFAS. These include:

1. Disseminate information about the innovation. This can be accomplished through an administrative memo with an attached information packet, presentation over the satellite network, or other multimedia system. Within this information include a description of what the medium is and the courses and/or type of training the system will deliver.

2. Hall (1979, p. 205) suggests providing information that contrasts "what the individual is presently doing with what use of the innovation would entail". This intervention will involve contrasting what the traditional classroom and on-the-job training methods entailed versus what the satellite medium entails. To specifically address the managers concerns, this information should also include the managers' logistical concerns, namely, the method of course announcements; registration procedures; and course material disbursement. Additionally, contrasting information such as the length of the programs and the time of day the programs will be offered will address specific questions of the managers and their concerns regarding scheduling employees and time constraints.

This intervention should also include contrasting the learning environments of the traditional and new methods, particularly with respect to equipment required for the medium, and the personnel that might support satellite education and training, i.e. technicians and classroom facilitators. This information will also address some of the managers' stated concerns.

3. Hall's third intervention is to visit a site that is using the innovation. DFAS can easily accomplish this intervention by informing the managers of the location of the classrooms linked with the satellite in their respective locations and providing the managers the opportunity to view a class while in session. This intervention will address expressed concerns regarding: how the classroom and the system operates; the availability of accommodations for the hearing impaired; and the type and amount of interaction between the instructor and the students during a broadcast that is reaching several sites.

4. The fourth suggested intervention for this stage is the involvement of others who are enthusiastic about their experiences with the innovation. To institute this intervention DFAS could invite the active duty, uniformed services or members of the reserve components who are using this type of satellite system (see Merz, 1994) to share their experiences and results of their training. This sharing of experiences may also alleviate some of the concerns about potential negative effects the medium may have on the learning.

5. Lastly, Hall suggests providing information about the anticipated cost/benefits of using the innovation. To address the managers' specific questions and concerns, the cost/benefits should include not only those of cost savings for travel expenses, but also the expected benefits of the medium and programs that will be provided. Of particular note in regard to programs was the explicit concern that courses may not be job related, task specific, or germane to the DFAS mission. Emphasizing the relevance and the benefits of the training for DFAS is recommended.

Of the six interventions discussed in the previous section for Stage 2 (Personal concerns), three seem the most appropriate for DFAS. However, implementation of these interventions will depend on the decisions made by senior management with respect to who will be required to attend the training, the anticipated time frames for full operation of training by satellite, and the extent that the satellite medium will be used for training.

These interventions are briefly discussed as follows.

1. One of Halls's suggestions is to explain the relationship between the innovation and other demands that may be potential conflicts in terms of personal energy and time constraints. Some of the respondents stated concerns about time constraints between heavy workloads and time for training. Specifically, there was little time for training during working hours. This concern about programs should be addressed by senior management.

2. Another of Hall's (1979, p. 206) suggestions is to "show how the innovation can be used via gradual introduction rather than with a major, all-encompassing leap..." This strategy will depend on the immediacy and extent of the use of satellite training as determined by DFAS senior management. Nevertheless, a gradual introduction is recommended.

3. The provision of support and assistance when using the innovation is another suggested intervention by Hall. Several of the managers expressed questions about the availability of technical support during broadcast times. Others expressed concerns about

whether or not a facilitator would be present during the training. DFAS should be mindful of the significance of these personnel.

Following the initial sessions on the satellite network, DFAS should anticipate Stage 3 concerns. This would be expected due to the nature of this population and to the findings of Hall's (1979, p. 206) research which showed Management concerns "... become most intense *after* first use of the innovation". However, as some of the managers expressed concern about programs, intense management concerns may peak for these individuals after the system and program offerings become operational. In any event, DFAS should expect that the managers will be concerned about management issues such as time constraints, scheduling, organizing work loads, and resources relative to the change. Interventions for these concerns are deferred to DFAS training policy.

A final consideration is with respect to the "impact" concerns: Consequences (Stage 4); Collaboration (Stage 5); and Refocusing (Stage 6). The respondents, both collectively and as a population in each Center, initially expressed a higher relative intensity in Stage 5 compared to the intensity of the other "impact" Stages. This was not unexpected given the position and role of the managers. Additionally, some of the managers also expressed concerns regarding the consequences of the satellite medium on the learning and the overall effectiveness of the training. This concern would be expected from a manager who is accountable for employee productivity, especially during times of budget cuts and staff reductions. Although the future intensity of these concerns cannot

be predicted, as several factors influence these stages, DFAS should be mindful that these concerns are beginning to surface.

### **Recommendations for Further Research**

This study explored the utility of the Stages of Concern, using a modified version of the SoC Questionnaire and the Open-Ended Statement of Concern about the Innovation, for a population of civilian managers employed in a Department of Defense organization. Although CBAM research began more than twenty years ago and the theory and measurements of CBAM's Stages of Concern have been proven valid and reliable, its application beyond that of schools has been limited. A possible reason for this fact may lie in the methods to assess the Stages of Concern. Additional testing of the method used for this study is clearly indicated for populations other than teachers. Simple modifications of the original SoCQ as demonstrated in this study may prove effective for assessing SoC of various populations, thereby, facilitating the application of the SoC theory and measurements to populations beyond educators.

Further investigation of the data obtained from this study may offer additional insight to the utility of the Stages of Concern and the methods used to assess those concerns. Stage concerns can be identified from the responses provided by the Open-Ended Statement as described by Newlove and Hall (1976) to explore if the qualitatively observed stages correspond with the quantitatively obtained stages identified



in this study. Although this method would require researchers who are qualified in qualitative analysis with the Open-Ended Statements of Concern about the Innovation, findings may add richness to the conclusions drawn in this study.

Longitudinal studies with the same population and the methods used in this study are required to further explore the utility of the Stages of Concern to this population. If the stage theory is operating, it would be expected that the findings from longitudinal studies would show higher relative intensity in the "task" and "impact" stages than that found in this study, that is, if the recommended interventions are appropriate to resolve the present state of concerns and were implemented. Appropriate interventions can be implemented in concert with the new findings and future concerns can be anticipated as hypothesized by concerns theory.

The population of this study was limited to civilian managers in DoD. Further investigation of the utility of the SoC and methods used to identify stage concerns can be extended to the uniformed personnel in the DFAS Centers. An exploratory study for the purposes of comparing the responses of the Army, Air Force, Navy, and Marine Corps personnel to those of the civilians may provide further insight to the potential influence culture has on change and adoption of innovations.

## Summary

The pivotal contribution of this study is the rendering of additional support to the utility of the Stages of Concern beyond its foundational roots in education. Although further investigation is required, this study supports the findings from previous research. That is, the theory underlying the Stages of Concern that change is a process of arousal (and resolution) of concerns which can be identified in a progressional order of "stages" is applicable to populations other than those of teachers and school administrators. Further, methods to assess the Stages of Concern may not require reinventing, but may demand only a simple modification of the original SoC Questionnaire. Lastly, from a practice perspective, the study introduced a theoretically based method, the Satellite Education and Training Survey, for which DFAS can assess Stages of Concern about satellite education and training over time, monitor movement through the stages, and evaluate if the interventions used facilitated movement through the change process.

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## **APPENDIX A**

### **Stages of Concern About the Innovation**

## Stages of Concern about the Innovation

Impact	6	<b>REFOCUSING:</b> The focus is on exploration of more universal benefits from the innovation, including the possibility of major changes or replacement with a more powerful alternative. Individual has definite ideas about alternatives to the proposed or existing form of the innovation.
	5	<b>COLLABORATION:</b> The focus is on coordination and cooperation with others regarding use of the innovation.
	4	<b>CONSEQUENCE:</b> Attention focuses on impact of the innovation on student in his/her immediate sphere of influence. The focus is on relevance of the innovation for students, evaluation of students outcomes, including performance and competencies, and changes needed to increase student outcomes.
Task	3	<b>MANAGEMENT:</b> Attention is focused on the processes and tasks of using the innovation and the best use of information and resources. Issues related to efficiency, organizing, managing, scheduling, and time demands are utmost.
Self	2	<b>PERSONAL:</b> Individual is uncertain about the demands of the innovation, his/her inadequacy to meet those demands, and his/her role with the innovation. This includes analysis of his/her role in relation to the reward structure of the organization, decision making, and consideration of potential conflicts with existing structures or personal commitment. Financial or status implications of the program for self and colleagues may also be reflected.
	1	<b>INFORMATIONAL:</b> A general awareness of the innovation an interest in learning more detail about it is indicated. The person seems to be unworried about himself/herself in relation to the innovation. She/he is interested in substantive aspects of the innovation in a selfless manner such as general characteristics, effects, and requirements for use.
Unrelated	0	<b>AWARENESS:</b> Little concern about or involvement with the innovation is indicated.

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Source: Hall, G. E. & Hord, S. M., 1987. Change in schools. Facilitating the process. New York: State University of New York Press. p. 60. (Reproduced with permission of Dr. Gene E. Hall. Retyped and formatted to conform to dissertation format.)

## **APPENDIX B**

### **Survey Questionnaire and Cover Letter - First Mailing**



Section C

CONCERNS QUESTIONNAIRE

The purpose of this questionnaire is to determine what people who are using or thinking about using various programs are concerned about at various times during the innovation adoption process. Although this questionnaire has been modified for use by DFAS managers and supervisors, it was originally developed from typical responses of school and college teachers who ranged from no knowledge at all about various programs to many years experience in using them. Therefore a good part of the items on this questionnaire may appear to be of little relevance or irrelevant to you at this time. For the completely irrelevant items, please circle "0" on the scale. Other items will represent those concerns you do have, in varying degrees of intensity, and should be marked higher on the scale.

For example:

- This statement is very true of me at this time. 0 1 2 3 4 5 6 ⑦
- This statement is somewhat true of me now. 0 1 2 3 ④ 5 6 7
- This statement is not at all true of me at this time. 0 ① 2 3 4 5 6 7
- This statement seems irrelevant to me. ① 1 2 3 4 5 6 7

Please respond to the items in terms of your present concerns or how you feel about your involvement or potential involvement with Satellite Education/Training for DFAS employees. Satellite Education/Training should not be confused with PictureTel, the video-teleconferencing system used by DFAS for administrative meetings and occasionally for educational programs. Please think of Satellite Education/Training in terms of your own perception of what it involves.

Since this questionnaire is used for a variety of innovations, the name Satellite Education/Training never appears. However, phrases such as "the innovation", "this approach", and "the new system" all refer to Satellite Education/Training. Remember to respond to each item in terms of your present concerns about your involvement or potential involvement with Satellite Education/Training.

Please complete the questionnaire and return it along with this page in the accompanying self addressed envelope within 5 days.

Thank you for taking time to complete this task.

## CONCERNS QUESTIONNAIRE

	0	1	2	3	4	5	6	7	
	Irrelevant	Not true of me now			Somewhat true of me now			Very true of me now	
1. I am concerned about employees' attitudes toward this innovation.	0	1	2	3	4	5	6	7	
2. I now know of some other approaches that might work better.	0	1	2	3	4	5	6	7	
3. I don't even know what the innovation is.	0	1	2	3	4	5	6	7	
4. I am concerned about not having enough time to organize myself each day.	0	1	2	3	4	5	6	7	
5. I would like to help other managers in their use of the innovation.	0	1	2	3	4	5	6	7	
6. I have a very limited knowledge about the innovation.	0	1	2	3	4	5	6	7	
7. I would like to know the effect of reorganization on my professional status.	0	1	2	3	4	5	6	7	
8. I am concerned about conflict between my interests and my responsibilities.	0	1	2	3	4	5	6	7	
9. I am concerned about revising my use of the innovation.	0	1	2	3	4	5	6	7	
10. I would like to develop working relationships with both our managers and outside managers using this innovation.	0	1	2	3	4	5	6	7	
11. I am concerned about how the innovation affects employees.	0	1	2	3	4	5	6	7	
12. I am not concerned about this innovation.	0	1	2	3	4	5	6	7	
13. I would like to know who will make the decisions in the new system.	0	1	2	3	4	5	6	7	
14. I would like to discuss the possibility of using the innovation.	0	1	2	3	4	5	6	7	
15. I would like to know what resources are available if we decide to adopt this innovation.	0	1	2	3	4	5	6	7	
16. I am concerned about my inability to manage all the innovation requires.	0	1	2	3	4	5	6	7	
17. I would like to know how my teaching or administration is supposed to change.	0	1	2	3	4	5	6	7	
18. I would like to familiarize other departments or persons with the progress of this new approach.	0	1	2	3	4	5	6	7	

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## CONCERNS QUESTIONNAIRE

	0	1	2	3	4	5	6	7
	Irrelevant	Not true of me now	Somewhat true of me now			Very true of me now		
19. I am concerned about evaluating my impact on employees.	0	1	2	3	4	5	6	7
20. I would like to revise the innovation's instructional approach.	0	1	2	3	4	5	6	7
21. I am completely occupied with other things.	0	1	2	3	4	5	6	7
22. I would like to modify our use of the innovation based on the experience of our employees.	0	1	2	3	4	5	6	7
23. Although I don't know about this innovation, I am concerned about things in the area.	0	1	2	3	4	5	6	7
24. I would like to excite my employees about their part in this approach.	0	1	2	3	4	5	6	7
25. I am concerned about time spent working with nonacademic problems related in this innovation.	0	1	2	3	4	5	6	7
26. I would like to know what the use of the innovation will require in the immediate future.	0	1	2	3	4	5	6	7
27. I would like to coordinate my effort with others to maximize the innovation's effects.	0	1	2	3	4	5	6	7
28. I would like to have more information on time and energy commitments required by this innovation.	0	1	2	3	4	5	6	7
29. I would like to know what other managers are doing in this area.	0	1	2	3	4	5	6	7
30. At this time, I am not interested in learning about this innovation.	0	1	2	3	4	5	6	7
31. I would like to determine how to supplement, enhance, or replace the innovation.	0	1	2	3	4	5	6	7
32. I would like to use feedback from employees to change the program.	0	1	2	3	4	5	6	7
33. I would like to know how my role will change when I am using the innovation.	0	1	2	3	4	5	6	7
34. Coordination of tasks and people is taking too much of my time.	0	1	2	3	4	5	6	7
35. I would like to know how this innovation is better than what we have now.	0	1	2	3	4	5	6	7

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DEFENSE FINANCE AND ACCOUNTING SERVICE

1931 JEFFERSON DAVIS HIGHWAY  
ARLINGTON, VA 22240-5291

MAY 3 1996

DFAS-HQ/H

MEMORANDUM TO MANAGERS AND SUPERVISORS OF THE DEFENSE  
FINANCE AND ACCOUNTING SERVICE

SUBJECT: Satellite Education and Training Survey

Satellite Education and Training is the wave of the future for DFAS. You are a very important part of the success of this training initiative. DFAS employees are or will be receiving courses by satellite. Therefore, we need you to tell us what you think about Satellite Education and Training. Regardless of your experience with this method of training, we want to hear your opinions.

We are conducting a survey to get your views about Satellite Education/Training. This is your opportunity to express your opinions. Your participation in this survey is voluntary and confidential. However, without your help, we may lack significant information required for effective training for DFAS. Clearly, you are the ones who understand the significance of training on job performance.

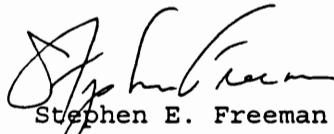
The attached Satellite Education/Training survey will only take about 15 minutes to complete. It will ask for your concerns about Satellite Education/Training. Do not confuse Satellite Education/Training with PictureTel. PictureTel is used for our videoteleconferencing and occasionally for training programs. Unlike PictureTel, satellite systems offer full motion video like the television in your home. Some of you may refer to Satellite Education/Training as videoteletraining or teletraining.

The attached Concerns Questionnaire in Section C has been modified for DFAS and is used for a variety of innovations. Therefore, the term Satellite Education/Training does not appear in any of the items. Phrases such as "the innovation", "this approach", and "the

new system" all refer to Satellite Education/Training. Respond to each item in terms of your present concerns about your involvement or potential involvement with Satellite Education/Training.

Complete the survey and mail it in the attached, self-addressed, stamped envelope within five days. Your point of contact for this survey is Jacque Merz, (703) 494-3202.

Thank you for helping us provide you and your employees good training experiences.



Stephen E. Freeman  
Deputy Director for Human Resources

Attachment  
As Stated

## **APPENDIX C**

### **Follow-Up Cover Letter**



## DEFENSE FINANCE AND ACCOUNTING SERVICE

1931 JEFFERSON DAVIS HIGHWAY  
ARLINGTON, VA 22240-5291

MAY 23 1996

DFAS-HQ/H

MEMORANDUM TO MANAGERS AND SUPERVISORS OF THE DEFENSE  
FINANCE AND ACCOUNTING SERVICE

SUBJECT: Satellite Education and Training Survey

About three weeks ago we sent you a Satellite Education/Training survey asking for your opinions about Satellite Education and Training. We have not heard from you, and we need your input. Your responses can help us provide DFAS employees with good training experiences. Clearly, you know the importance of training on job performance.

Your participation is voluntary and confidential. The survey will take only about 15 minutes to complete. Attached is a copy of the survey and a self-addressed stamped envelope.

The survey will ask you for your concerns about Satellite Education/Training. Please do not confuse Satellite Education/Training with PictureTel. PictureTel is used for our videoteleconferencing and occasionally for training programs. Unlike PictureTel, satellite systems offer full motion video like the television in your home. Some of you may refer to Satellite Education/Training as videoteletraining or teletraining.

The attached Concerns Questionnaire in Section C has been modified for DFAS and is used for a variety of innovations. Therefore, the term Satellite Education/Training does not appear in any of the items. Phrases such as "the innovation", "this approach", and "the new system" all refer to Satellite Education/Training. Respond to each item in terms of your present concerns about your involvement or potential involvement with Satellite Education/Training.

Complete the survey and mail it in the attached self-addressed, stamped envelope within five days. Your point of contact for this survey is Jacque Merz, (703) 494-3202

Thank you for your assistance. If you have returned the first survey, please disregard this memorandum.



Stephen E. Freeman  
Deputy Director for Human Resources

Attachment  
As Stated

## **APPENDIX D**

### **Modified Stages of Concern Questionnaire Items by Stage**

## **Modified SoC Questionnaire Items by Stage**

### **Item**

### **Stage 0 - Awareness**

- 3 I don't even know what the innovation is.  
12 I am not concerned about this innovation.  
21 I am completely occupied with other things.  
23 Although I don't know about this innovation, I am concerned about things in the area.  
30 At this time, I am not interested in learning about this innovation.

### **Stage 1 - Informational**

- 6 I have a very limited knowledge about the innovation.  
14 I would like to discuss the possibility of using the innovation.  
15 I would like to know what resources are available if we decide to adopt this innovation.  
26 I would like to know what the use of the innovation will require in the immediate future.  
35 I would like to know how this innovation is better than what we have now.

### **Stage 2 - Personal**

- 7 I would like to know the effect of reorganization on my professional status.  
13 I would like to know who will make the decisions in the new system.  
17 I would like to know how my teaching or administration is supposed to change.  
28 I would like to have more information on time and energy commitments required by this innovation.  
33 I would like to know how my role will change when I am using the innovation.

### **Stage 3 - Management**

- 4 I am concerned about not having enough time to organize myself each day.  
8 I am concerned about conflict between my interests and my responsibilities.  
16 I am concerned about my inability to manage all the innovation requires.  
25 I am concerned about the time spend working with nonacademic problems related to this innovation.  
34 Coordination of tasks and people is taking too much of my time.

### **Stage 4 - Consequence**

- 1 I am concerned about employees' attitudes toward this innovation.  
11 I am concerned about how the innovation affects employees.  
19 I am concerned about evaluating my impact on employees.  
24 I would like to excite my employees about their part in this approach.  
32 I would like to use feedback from employees to change the program.

### **Stage 5 - Collaboration**

- 5 I would like to help other managers in their use of innovation.  
10 I would like to develop working relationships with both our managers and outside managers using this innovation.  
18 I would like to familiarize other departments or persons with the progress of this new approach.  
27 I would like to coordinate my effort with others to maximize the innovation's effects.  
29 I would like to know what other managers are doing in this area.

### **Stage 6 - Refocusing**

- 2 I now know of some other approaches that might work better.  
9 I am concerned about revising my use of the innovation.  
20 I would like to revise the innovation's instructional approach.  
22 I would like to modify our use of the innovation based on the experience of our employees.  
31 I would like to determine how to supplement, enhance, or replace the innovation.

---

Adapted from: Hall, G. E., George, A. A., & Rutherford, W. A. (1986). Measuring stages of concern about the innovation: A manual for use of the SoC questionnaire. Austin, TX: Southwest Educational Development Laboratory. p. 25. (Names of Stages added. Statements modified with permission of Dr. Gene E. Hall.)

## **APPENDIX E**

### **Modified Stages of Concern Questionnaire Statements**



### Modified Stages of Concern Questionnaire Statements

1. I am concerned about *students'* attitudes towards this innovation.
1. I am concerned about *employees'* attitudes towards this innovation.
  
5. I would like to help other *faculty* in their use of the innovation.
5. I would like to help other *managers* in their use of the innovation.
  
10. I would like to develop working relationships with both our *faculty* and outside *faculty* using this innovation.
10. I would like to develop working relationships with both our *managers* and outside *managers* using this innovation.
  
11. I am concerned about how the innovation affects *students*.
11. I am concerned about how the innovation affects *employees*.
  
19. I am concerned about evaluating my impact on *students*.
19. I am concerned about evaluating my impact on *employees*.
  
22. I would like to modify our use of the innovation based on the experiences of our *students*.
22. I would like to modify our use of the innovation based on the experience of our *employees*.
  
24. I would like to excite my *students* about their part in this approach.
24. I would like to excite my *employees* about their part in this approach.
  
29. I would like to know what other *faculty* are doing in this area.
29. I would like to know what other *managers* are doing in this area.
  
32. I would like to use feedback from *students* to change the program.
32. I would like to use feedback from *employees* to change the program.

---

Note: The first statement of each item reads as the original SoC Questionnaire.  
The second statement shows the modification made for the study.

## **APPENDIX F**

### **Experience with Satellite Education**

**Distribution by Number of Courses Completed by Satellite**

Center	Columbus		Denver		Indianapolis		Kansas City		Cleveland		Total		
	Courses	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
	<b>0</b>	118	87	76	87	43	72	22	100	51	78	310	84
	<b>1</b>	8	6	7	8	4	7			10	15	29	8
	<b>2</b>	5	4	3	3	8	13			3	5	19	5
	<b>3</b>	3	2			2	3			1	2	6	2
	<b>6</b>	1	1			1	2					2	1
	<b>8</b>					1	2					1	< 1
	<b>10</b>			1	1	1	2					2	1
	<b>19</b>	1	1									1	< 1
	<b>Total</b>	136	37	87	24	60	16	22	6	65	18	370	101

All percents rounded to nearest whole percent

## **APPENDIX G**

### **Highest Stages of Concern by Management Responsibility**

**Highest Stage of Concern by Manager Responsibility of Number of Employees**

<b>Highest SoC</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>Total Freq</b>
<b># of Employees</b>	<b>Freq</b>	<b>Freq</b>	<b>Freq</b>	<b>Freq</b>	<b>Freq</b>	<b>Freq</b>	<b>Freq</b>	
<b>1-10</b>	47	23	10	1		2	3	86
<b>11-20</b>	62	27	11	2		2		104
<b>21-30</b>	14	10	4	1		1		30
<b>31-40</b>	15	9	6			1		31
<b>41-50</b>	4	4	3	1		1		13
<b>51-100</b>	14	8	6		1			29
<b>101-200</b>	15	9	1		1	1		27
<b>201-500</b>	4	4				2	1	11
<b>&gt;500</b>	4	3	1			2		10
<b>Total</b>	179	97	42	5	2	12	4	341

## **APPENDIX H**

### **Years of Employment in the Federal Government and Highest Stages of Concern**

**Years of Employment in the Federal Government and Highest Stage of Concern**

<b>Highest SoC</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>Total Freq</b>
<b>Years of Employment</b>	<b>Freq</b>	<b>Freq</b>	<b>Freq</b>	<b>Freq</b>	<b>Freq</b>	<b>Freq</b>	<b>Freq</b>	
<b>1-5</b>	13	7	3					23
<b>6-10</b>	27	18	5	1		3		54
<b>11-15</b>	29	18	6	1		2	2	58
<b>16-20</b>	37	20	12	1	1	1		72
<b>21-25</b>	43	16	6			3	1	69
<b>&gt;25</b>	30	18	10	2	1	3	1	65
<b>Total</b>	179	97	42	5	2	12	4	341

## **APPENDIX I**

### **Financial Manager Population Completing Concerns Questionnaire and Years of Employment in Financial Management and Highest SoC**



**Financial Manager Population with Completion of Concerns Questionnaire**

<b>Center</b>	<b>Columbus</b>	<b>Denver</b>	<b>Indianapolis</b>	<b>Kansas City</b>	<b>Cleveland</b>	<b>Total</b>
number (n)	120	72	50	17	57	316

**Years of Employment in Financial Management and Highest Stage of Concern**

<b>Highest SoC</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>Total Freq</b>
<b>Years of Employment</b>	<b>Freq</b>	<b>Freq</b>	<b>Freq</b>	<b>Freq</b>	<b>Freq</b>	<b>Freq</b>	<b>Freq</b>	
<b>1-5</b>	19	12	7	1		1		40
<b>6-10</b>	27	13	4	1		1	2	48
<b>11-15</b>	30	14	4	1		3	1	53
<b>16-20</b>	32	25	9		1	1		68
<b>21-25</b>	33	10	6				1	50
<b>&gt;25</b>	25	18	7	1	1	5		57
<b>Total</b>	166	92	37	4	2	11	4	316

## Vita

I was born in St. Louis, Missouri on January 22, 1948. I started school at the age of 4, and became a registered nurse at the age of 20 after earning an A.A.S. degree from Forest Park Community College in 1968. Six months later I was supervising more than 20 nurses and support staff and was responsible for the care of a 70 patient surgical unit at the Research Hospital and Medical Center in Kansas City, Missouri. By the time I received a B.S. degree with a major in nursing from California State University in 1980, my specialities expanded to neurology, immunology, and oncology. After studying under a naturopathist at California State University, I became enamored with biochemistry and pathophysiology and learned the interconnection of these two sciences with the powerful influence of the human mind to reduce physical pain. I developed skills of noninvasive techniques for pain reduction and used them during my practice in cancer research, with patients in chronic and acute pain, and taught these techniques to Hospice volunteers and family members of the terminally ill and allied health students and professionals.

After working with school nurses and psychologists to attend to the physical, psychological, and learning needs of children of middle and low income families in a southern California school district, I became certified in public health. The partnership between the caring profession of nursing and the helping profession of teaching led me to teaching and administration in community and postsecondary education.

For ten years I directed, developed core curriculum, and taught allied health professions and professionals. I taught and directed an Emergency Medical Technician

program at the votech level in California, and wrote, directed, and taught an A.S. degree program for Medical Administrative Assistants for a junior college in Florida. I wrote certification programs for Pharmacy and Rehabilitative Service Technicians for one hospital and was an education consultant for the joint venture of Mary Washington Hospital, Northern Virginia Community College and Germanna Community College, Radiologic Technology A.S. degree program. I taught as a volunteer for the American Red Cross, the American Heart Association, and Hospice. My students have ranged from active 5 year olds to the aged and terminally ill, and from the general public to students and professionals in several career fields.

I earned a Master of Science in Education (Adult and Continuing Education) from Virginia Polytechnic Institute and State University in 1990. Two years later I became Program Director in Continuing Education at Virginia Tech's Graduate Center in northern Virginia and expanded my programming skills to address client groups in business, industry, and government. That same year I was President of Phi Delta Kappa's, Virginia Tech-Northern Virginia chapter and have since been an active board member. In 1995 I received the Certificate of Advanced Graduate Studies from Virginia Tech.

I maintain active licensure to practice as a Registered Nurse in Missouri, Virginia, and California where I am also certified as a Public Health Nurse, and am required to verify 30 hours of continuing education in nursing biannually.

A handwritten signature in cursive script, reading "Jacqueline A. Meyer", is written over a horizontal line.