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Facility Administrator Perceptions of the External Environmental Constituencies Shaping Urban Advanced Technology Centers

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**FACILITY ADMINISTRATOR PERCEPTIONS OF THE
EXTERNAL ENVIRONMENTAL CONSTITUENCIES SHAPING
URBAN ADVANCED TECHNOLOGY CENTERS**

by

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B.S. December 1986, Old Dominion University
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**A Dissertation Submitted to the Faculty of
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ABSTRACT

FACILITY ADMINISTRATOR PERCEPTIONS OF THE EXTERNAL ENVIRONMENTAL CONSTITUENCIES SHAPING URBAN ADVANCED TECHNOLOGY CENTERS

Daniel Robert Smith

Old Dominion University, 2002

Dissertation Director: Dr. John M. Ritz

The purpose of this study was to develop a list of the most relevant external environmental constituencies and responses to those elements that should be used by facility administrators of urban advanced technology centers. A three-round Delphi research method was conducted to garner the perceptions of the panel participants. The President's Advisory Council and the Board of Directors of the National Coalition of Advanced Technology Centers were asked to nominate facility administrators of urban advanced technology centers to serve as expert panel participants. Of the 17 facility administrators nominated, nine agreed to participate and completed all three rounds of the investigation.

The first research question asked facility administrators to define those external environmental constituencies of urban advanced technology centers that are relevant to goal setting, goal achievement, effectiveness, and survival. From the inputs of the panelists, 14 relevant external environmental constituencies were derived. The results

identified a broad array of external influences including other educational organizations, area politicians, cultural values, demographics, and economic development organizations.

The second research question was to determine the relative importance of the 14 identified external environmental constituencies. Median scores assessing the relevance of the external environmental constituencies were obtained from the final two rounds of the Delphi study. With total consensus, area business and advanced technology center cultural values were perceived to be the most relevant external environmental constituencies. Economic and market forces, information technologies, and current workers were identified by the panelists to be relevant to urban advanced technology centers. Accrediting agencies and taxpayers were perceived by the panelists to have only limited relevance to goal setting, goal achievement, effectiveness, and survival of urban advanced technology centers.

To answer research question three, how should facility administrators of urban advanced technology centers respond to the 14 identified relevant external environmental constituencies, the researcher reviewed various external management strategies for possible use. The external management strategies suggested were planning and forecasting, boundary spanning, adjusting internal operations, establishing favorable linkages and altering the external environment.

The findings from this study provide facility administrators of urban advanced technology centers with a listing of relevant external environmental constituencies as perceived by other practicing facility administrators. Use of these findings could prove beneficial to urban advanced technology center facility administrators attempting to respond to the multitude of demands from external environmental constituencies.

This dissertation is dedicated to my wife, Fran, for her support and encouragement over the years as I pursued my academic goals.

ACKNOWLEDGEMENTS

There are many people who contributed to the successful fulfillment of this dissertation with their emotional support and practical advice to persevere and complete this research. I would like to offer my sincere appreciation to my dissertation committee: director Dr. John M. Ritz, and members Dr. John E. Turner, and Dr. Patrick M. Konopnicki, for their many hours of guidance. I am grateful to Dr. Diann Holt, Mr. Vernon King, and Mr. Jerry Stewart for their valuable assistance in interpreting the first-round questionnaire information. Their interpretations laid the foundation for the second and third-round questionnaires. My editor, Mrs. Jinxey Poniatowski, also deserves recognition for the assistance she provided in the final stages of this process.

This study probed the external environmental constituencies of urban advanced technology centers from the perspective of facility administrators. Literally, this investigation could not have occurred without the contributions from the panel participants. Each member of this long-distance gathering thought and reflected repeatedly to define the external forces that are most relevant to urban advanced technology centers. The friendly, professional support and encouragement given during this investigation by Dr. Richard C. Hinckley, Executive Director of the National Coalition of Advanced Technology Centers, is greatly esteemed.

Daniel R. Smith

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CHAPTER I

INTRODUCTION

Research has not reported how facility administrators of established urban advanced technology centers have defined the parameters of the external environment and guided subsequent responses to it. The external environment, those outside organizations and conditions which relate to a school's operation, is an element of the open-systems model. The open-systems model highlights the vulnerability and interdependence of organizations and their environments (Hoy & Miskel, 1996). Scott (1992) asserts that the central understanding emerging from open-systems theory is that all organizations are incomplete and depend on exchanges with other organizations in the environment as a condition of their survival.

Urban advanced technology centers, which are designed to prepare students to meet specific employment needs of the community, have an inherent obligation to identify and administratively internalize both immediate and long-term external environmental constituencies. These external environmental constituencies may be local employers, elected decision-makers, economic conditions, education associations, or parents. The number, complexity, and stability of these external environmental constituencies are vast. Therefore, the problem addressed in this study was to determine those external environmental constituencies that are most relevant to urban advanced technology centers. In order to identify what these external environmental constituencies are, this problem was analyzed and responses prioritized by the administrators that interact daily with the external environmental constituencies of urban advanced technology centers.

While this study will be beneficial for a number of reasons, the potential advantage to youth of the urban underclass ranks as paramount. Urban advanced technology centers (ATCs) offer students, many from low social-economic families, an opportunity to improve their life chances by acquiring specialized training in high-demand occupations. From an open-systems model view, facility administrators of urban ATCs that more effectively internalize the influences of the external environmental constituencies will, in turn, provide a better-prepared program completer and better support the economic development of the community.

Statement of the Problem

The purpose of this study was to develop a list of the most relevant external environmental constituencies and internal responses by facility administrators of urban advanced technology centers. The intent of this study was to contribute to the theoretical knowledge base of how these career and technical education institutions operate and to give facility administrators a more expansive database for decision-making in the operation of these centers.

Research Questions

This study was designed to develop a communication process that would clarify the information exchanges that urban advanced technology centers have with external environmental constituencies and, thus address the following research questions:

1. What external environmental constituencies of urban advanced technology centers are relevant to goal setting, goal achievement, effectiveness, and survival?
2. Of the identified external environmental constituencies, which are considered the most relevant?
3. How should facility administrators of urban advanced technology centers respond to the identified relevant external environmental constituencies?

The communication process employed to answer the first and second research questions was the Delphi research method. Results from the three surveys sent to a geographically diverse expert panel of facility administrators of urban advanced technology centers provided the data used to answer research questions one and two. Established, research-based, internal and interorganizational management strategies that address how schools should respond to external environmental constituencies were used to answer research question three.

Background and Significance

In the almost one hundred years of publicly funded secondary career and technical education in the United States, external environmental constituencies have remained a constant. One challenge for career and technical educational practitioners, including facility administrators of urban ATCs, is to determine the extent to which the school organization can, should, or must respond to the multitude of environmental demands (Hoy & Miskel, 1996).

At the beginning of the 20th Century when practitioners and scholars of publicly-funded secondary career and technical education first began to respond to the external

environment, the U.S. economy was in the midst of a massive transition, one that involved workers moving from agriculture into industry. As the 21st Century begins, the economy is again in a state of flux; more and more workers are finding employment in the service and professional-technical industries as opposed to manufacturing. Thus, the issue of responses to external environmental constituencies remains (Levesque, et al., 2000).

The findings from this study are significant for several reasons. First, this information adds to the analysis of organizational behavior of schools as open-systems. Scholars who probe the organizational theory of schools as open-systems now have data on a major subset of education, urban advanced technology centers, that was previously unavailable. Second, these findings will be applied to the administration of an urban advanced technology center under development in Virginia Beach, Virginia. Additionally, current and future advanced technology centers, regional, joint, single-district career or technical education centers, have access to a rank-ordered list of external environmental constituencies that can be used for facility planning and goal setting.

Prior to this study, there was not consensus among those charged with leading urban ATCs as to what the most relevant external environmental constituencies are, let alone what actions are to be taken in anticipation of or reaction to these external environmental constituencies. This was understandable considering the external environment contains a multitude of often interrelated, dynamic elements. Regardless of the complex relationship between a school and its external environment from a facility administrator's perspective, it is essential to investigate. According to Beer (1980),

examining the external environment is important in understanding the tasks of the organization and its required structures and management processes.

With respect to the significance of the results of this endeavor, it begins to fill a gap in current educational research of career and technical education centers. It has been noted that very few analytical studies have been made of career and technical education centers in large cities, let alone the more defined area of career and technical education centers (Evans, 1971).

Urban Significance

Another facet of the significance of this study is that the workforce preparation skills provided by urban advanced technology centers will help youth transcend the “glass wall” (Norfolk, 1994). “People living inside the ‘glass wall’ can see the opportunities and advantages all around, but they cannot reach them. The residents have lost faith with the city and they suffer a social illness called impoverishment of the spirit. This illness is often fatal to individuals and neighborhoods and can, if it reaches epidemic proportions, even kill a city” (Norfolk, 1994). During May 2001, national statistics revealed that 6.2 million people were looking for work. “The highest unemployed groups were teenagers (13.6 percent), blacks (8 percent), and Hispanics (6.2 percent)” (Staff & Wire Reports, 2001).

The wage and employment disparity between skilled and unskilled workers is growing. This is believed to be partly because education and training are considered more important than ever in the new global economy. Simultaneously, changes in technology are producing new jobs while making many others obsolete (Wilson, 1996).

In the book, *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*, Wilson (1997) discusses policies to attack the problems of the truly disadvantaged in the United States. It is his belief that the best approach would be through universal programs that enjoy the support and commitment of a broad constituency. Under this approach, programs based on the principle of equality of group opportunity or that of equality of life chances should be secondary to universal programs. According to Wilson, "The hidden agenda is to improve the life chances of groups such as the ghetto underclass by emphasizing programs in which the more advantaged groups of all races can positively relate" (Wilson, 1987, p.120).

The course offerings of urban ATCs provide specialized training in state-of-the-art technologies such as engineering sciences, manufacturing, industrial technologies, information technologies, and telecommunications (Tidewater Community College, 1999). The training students receive at urban ATCs may be envisioned as one of Wilson's hidden agenda items. The current labor market demand for qualified technicians is such that when urban youth complete advanced technology center programs they will have made a major step in transcending the "glass wall." These youth can go directly into the workforce and they are prepared for advanced education and training.

Limitations

The participants involved with this study were selected from the membership list of the National Coalition of Advanced Technology Centers; therefore, the expert panelists will be limited to this member organization. This study reflects the perceptions

of the facility administrators of established urban advanced technology centers only. It does not include the viewpoints of the instructors of those institutions.

Of the institutions that are members of the National Coalition of Advanced Technology Centers, some are located within cities, while others are not. In order to maintain an urban focus to this study, only facility administrators of urban centers were asked to participate in this study.

The open-systems model contains numerous elements; the external environment is just one of those elements. To provide a manageable range of study, only the external environment of urban advanced technology centers was the subject of this research project. There was no attempt to specify explicit linkages between the other open-systems model elements such as inputs, outputs, technology, external environment, behavior and processes, culture, and structure (Beer, 1980; Hoy & Miskel, 1996).

Assumptions

At the time of this study, the number of unemployed workers in the United States was at a near forty-year low. The rate of unemployment in the United States at the end of February 2001 was 4.6 percent. Analysts consider joblessness below 5 percent to be essentially full employment (Davis, 2001). During periods of full employment, workers are needed by employers, but often are not available. One strategy that employers use to meet this need is to contact career and technical education centers for pending or recent graduates. Therefore, one could assume that a major external environmental constituency of urban advanced technology centers, employers, would be more involved with ATCs now during this period of full employment.

While each of the sample centers was located in an urban area, the location of the school and the economic and political characteristics of the locale differ. Therefore, the perspective of each of the facility administrators would be expected to be a product of their unique situation.

Definitions

The following terms were defined to provide focus for the reader:

Advanced Technology Center: a regional resource for shared instruction and training of students in the latest engineering sciences, manufacturing and industrial technologies, information technologies, and telecommunications (Tidewater Community College, 1999).

Behavior and Processes: prevailing patterns of behavior, interactions, and relations between groups and individuals (Harrison, 1994).

Boundary Spanning: process of reaching out beyond the school and attempting to link with selected external environmental constituencies (Gordon, et al., 1999; Hoy & Miskel, 1996; University of Missouri, 2000).

Cooptation: strategy of unofficially bringing important representatives from relevant external environmental constituencies into the policy structure of the school organization (Gordon, et al., 1999; Hoy & Miskel, 1996).

Culture: commonly held beliefs about how an organization is and should be operating (Beer, 1980).

Elements of an Open-Systems Model: may include inputs, outputs, technology, environment, goals and strategies, behavior and processes, culture, and structure (Harrison, 1994).

External Environment: can be categorized as either the task environment or the general environment. The task environment includes all the external organizations and conditions that are directly related to a school's main operation. They may include parents, taxpayers, regulatory agencies, local employers, legislatures, accrediting agencies, educational associations, local politicians, colleges and universities, local churches, local media, and collaborative partners. The general environment includes institutions and conditions having infrequent or long-term impacts on the organization and its task environment. They may include the economy, the legal system, the state of scientific and technical knowledge, social institutions such as family, population distribution and composition, the political system, and the local or national cultures within which the school operates (Harrison, 1994; Hoy & Miskel, 1996).

Goals: future states sought by the organization's dominant decision-makers (Harrison, 1994).

Information Perspective: views the external environment as a source of information that school decision-makers may use in maintaining or changing the internal structures and processes of their schools (Hoy and Miskel, 1996).

Inputs: raw materials, money, people, equipment, information, knowledge, and legal authorizations that an organization obtains from its external environment and that contribute to the creation of its outputs (Harrison, 1994).

Institutional Perspective: assumes that some external environmental constituencies encourage schools to conform to the norms, values, and ideologies institutionalized in society (Hoy & Miskel, 1996).

Outputs: products, services, and ideas that are the outcomes of organizational action. Organizations transfer most outputs back to the external environment and use others internally (Harrison, 1994).

Resource Dependence Perspective: considers the external environment as a place to gain resources for organizations (Aldridge, 1972; Benson, 1975).

Structure: formal aspects of an organization that include the bureaucratic expectations, a hierarchy of positions, rules and regulations, and specialization (Beer, 1980; Hoy & Miskel, 1996).

Technology: tools, machines, and techniques for transforming resources into output (Harrison, 1994).

Summary

Research had not defined the parameters of the external environment and how facility administrators of urban advanced technology centers should respond to these forces. Hence, the purpose of this study was to develop a profile of the external environmental constituencies and the responding management strategies that should be utilized by facility administrators of urban advanced technology centers.

This study was important for many reasons. This information adds to the analysis of organizational behavior of schools as an open-system. Scholars who probe the organizational theory of schools as an open-system now have data on the external

environmental constituencies of urban advanced technology centers that was previously unavailable. These findings will be applied to the administration of an urban advanced technology center under development in Virginia Beach, Virginia. Another aspect of the significance of this study was that in studying and applying research to improve urban advanced technology centers, the workforce preparation skills of urban youth and their opportunities may be enhanced.

Several limitations of this study are noteworthy. This study reflects the perceptions of the facility administrators of established urban advanced technology centers only. The open-systems model contains numerous elements; external environment being just one of those elements. In order to provide focus and to provide a manageable range of study, only the external environmental constituencies of urban advanced technology centers was the subject of this research project.

Various assumptions were postulated from the beginning of this study. The unemployment rate in the United States during this investigation was low. Due to the need for employees, employers are more apt to be involved with urban advanced technology centers than in times of greater unemployment. While each of the facility administrators works at a center that was located in an urban area, the location of the school and the economic and political characteristics of the community differ, which in turn, affected the perspective of each of the facility administrators.

Overview of Chapters

Chapter II reviews the literature related to system theory, the external environment, external management strategies, advanced technology centers, and the

Virginia Beach Advanced Technology Center. Chapter III details the use of a three-round Delphi research method to garner the parameters of the external environment of urban advanced technology centers. Chapter IV examines the results of the Delphi analysis. This examination relies on several descriptive statistics to measure the Delphi panel results including median, interquartile range, and rank order. Research-based external management strategies detailing how facility administrators of urban advanced technology centers should respond to the identified relevant external environmental constituencies also are offered. Figures, tables, and comments from the panelists are utilized to present aspects of this analysis. Chapter V summarizes this study and offers recommendations to facility administrators of urban advanced technology centers founded on research asserting that all organizations are incomplete and depend on exchanges with external environmental constituencies as a condition of their survival (Scott, 1992). Among these recommendations is how should facility administrators internalize those external environmental constituencies that have been identified as the most relevant to urban advanced technology centers.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this study was to develop a list of the most relevant external environmental constituencies and internal responses by facility administrators of urban advanced technology centers. Related to this purpose, a review of literature of system theory, external environment, external management strategies, and an analysis of advanced technology centers, including the Virginia Beach Advanced Technology Center, was conducted.

System Theory

System theory emerged after World War II, although its roots are much older. This general intellectual movement created new areas of study, stimulated new applications, and proposed closer linkages among scientific disciplines. Biologist Ludwig von Bertalanffy, the founder of the general system theory, argued that certain general ideas could have relevance across a broad spectrum of disciplines. In particular, he endeavored to show that many important entities studied by scientists such as nuclear particles, atoms, molecules, cells, organs, organisms, ecological communities, groups, organizations, societies, and solar systems are all subsumable under the general rubric of system (Scott, 1992).

The foundation of system theory is that all the components of an organization are interrelated, and that changing one variable might impact others (Kast & Rosenzweig, 1972; Scott, 1992). System theory basically is concerned with problems of relationships, structures, and interdependence (Katz & Kahn, 1966).

A major development in the analysis of organizational behavior was the distinction between open- and closed-systems (Hoy & Miskel, 1996). Early system analyses of schools viewed them as closed-systems, or sealed off from the outside world (Getzels & Guba, 1957). In the past, interpretations of how schools operated were offered according to the internal workings of the organization with little or no attention to outside forces. However, few contemporary organizational theorists now accept the premise that organizations can be understood in isolation of the events occurring externally (Hoy & Miskel, 1996).

Within system theory, three distinct, yet partly overlapping, partly complementary perspectives emerged (Scott, 1992). The three perspectives of organizations are rational-systems, natural-systems, and open-systems.

The rational-systems perspective views organizational systems as formal instruments orientated to the pursuit of relatively specific goals and exhibiting relatively highly formalized social structures (Scott, 1992). The rational approach has its roots in the classical organizational thought of the scientific managers. The behavior in rational-system organizations is seen as purposeful, disciplined, and rational. Goals are the desired ends that guide organizational behavior. Emphasis is placed upon the limitations of individual decisions. Specific goals direct decision-making, influence the formal structure, specify tasks, guide the allocation of resources, and govern design decisions (Hoy & Miskel, 1996). Elements of the rational-systems perspective are evident by examining the goals that most schools set for graduation rates and standardized test scores.

The natural-systems perspective views organizations primarily as social groups trying to adapt and survive in their particular situation. The natural-systems perspective has its roots in the human relations approach of the 1930s. It developed partly as a reaction to the scientific managers and perceived inadequacies of the rational-systems model. Within organizations with a natural-systems orientation, the characteristics of the individuals and their desire for the organization to continue are paramount to goal attainment. The rational-systems perspective stresses the importance of structure over individuals, while the natural-systems approach emphasizes individuals over structure (Hoy & Miskel, 1996). A school that has a natural-systems view may have goals for achieving set graduation rates and standardized test scores; however, if and how those goals will be realized depends a great deal on the norms and shared values of the school staff.

The open-systems model is a means of combining the rational and the natural-systems perspectives. Open-system organizations have formal structures designed to achieve goals and are also composed of individuals with needs, interests, and beliefs that often conflict with the mission of the organization (Hoy & Miskel, 1996). The main elements in the open-systems model are as follows:

- **Inputs** - Raw materials, money, people, equipment, information, knowledge, and legal authorizations that an organization obtains from its environment and that contribute to the creation of its outputs (Harrison, 1994).
- **Outputs** - Products, services, and ideas that are the outcomes of organizational action. Organizations transfer most outputs back to the environment and use others internally (Harrison, 1994).

- **Technology** - Tools, machines, and techniques for transforming resources into output (Harrison, 1994).
- **External Environment** - May be categorized as either task environment or general environment. The task environment includes all the external organizations and conditions that are directly related to a school's main operation. The general environment includes institutions and conditions having infrequent or long-term impacts on the organization and its task environment (Harrison, 1994; Hoy & Miskel, 1996).
- **Goals** - Future states sought by the organization's dominant decision-makers (Harrison, 1994).
- **Behavior and Processes** - Prevailing patterns of behavior, interactions, and relations between groups and individuals (Harrison, 1994).
- **Culture** - Commonly held beliefs about how an organization is and should be operating (Beer, 1980).
- **Structure** - Formal aspects of an organization that include the bureaucratic expectations, a hierarchy of positions, rules and regulations, and specialization (Beer, 1980; Hoy & Miskel, 1996).

The interacting elements in the open-systems model acquire inputs from the external environment, transform them, and produce outputs. Computers, instructional materials, teachers, and students are common inputs for schools. Students are transformed by the school into educated graduates and as outputs contribute to the external environment. Feedback from the external environment is information about how

that system is perceived from outside people and organizations (Hoy & Miskel, 1996).

Figure 1 illustrates the open-systems concept.

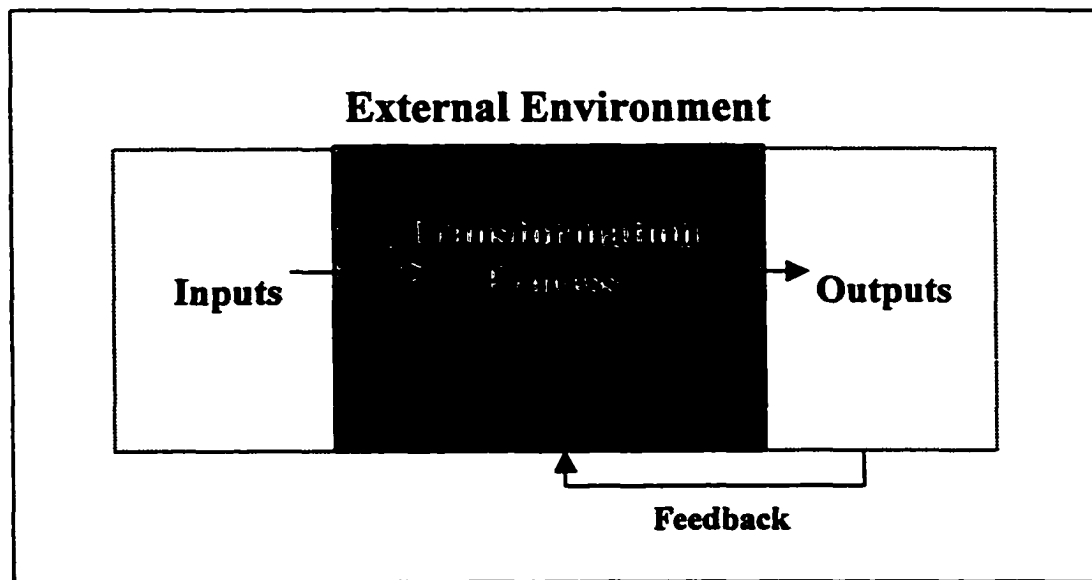


Figure 1. Open-Systems Concept. Adapted from Open-Systems with Feedback Loop (Hoy & Miskel, 1996).

Sufficient knowledge exists for urban ATCs to utilize organizational theory, processes, and methods to improve organization effectiveness (Rush, 1973). Beer (1980) declares that if program administrators are to be successful in overseeing organizational effectiveness, they must internalize an open-systems perspective for the following reasons:

- A model provides dimensions that guide data collection and diagnosis.
- A model illuminates the realization of the complex interaction between all dimensions and any specific problem.
- A model can aid in categorizing intervention strategies by the dimension of the organization to which they apply.

- A model forces program administrators to be specific about the outcomes they desire and how organizational changes will affect these outcomes.

External Environment

In addressing external environments, Griffiths (1959) postulates on the impact external environmental constituencies have on educational organizations. He believes that the major impetus for change in organizations is from the outside and that the degree and duration of change is directly proportional to the intensity of the stimulus from the external environmental constituencies. These statements underscore the importance of understanding and identifying the relevant external environmental constituencies of urban ATCs.

External environmental constituencies may be categorized as either task or general environment. The task environment includes all the external organizations and conditions that are related directly to a school's main operation. The general environment includes institutions and conditions having infrequent or long-term impacts on the organization and its task environment (Harrison, 1994; Hoy & Miskel, 1996). Figure 2 shows selected external environmental constituencies of urban advanced technology centers.

To define the concept of external environment constituencies further, three theoretical perspectives offer useful descriptions and explanations of the external environmental constituencies and their effects on ATCs. These perspectives are information, resource dependence, and institutional (Hoy & Miskel, 1996).

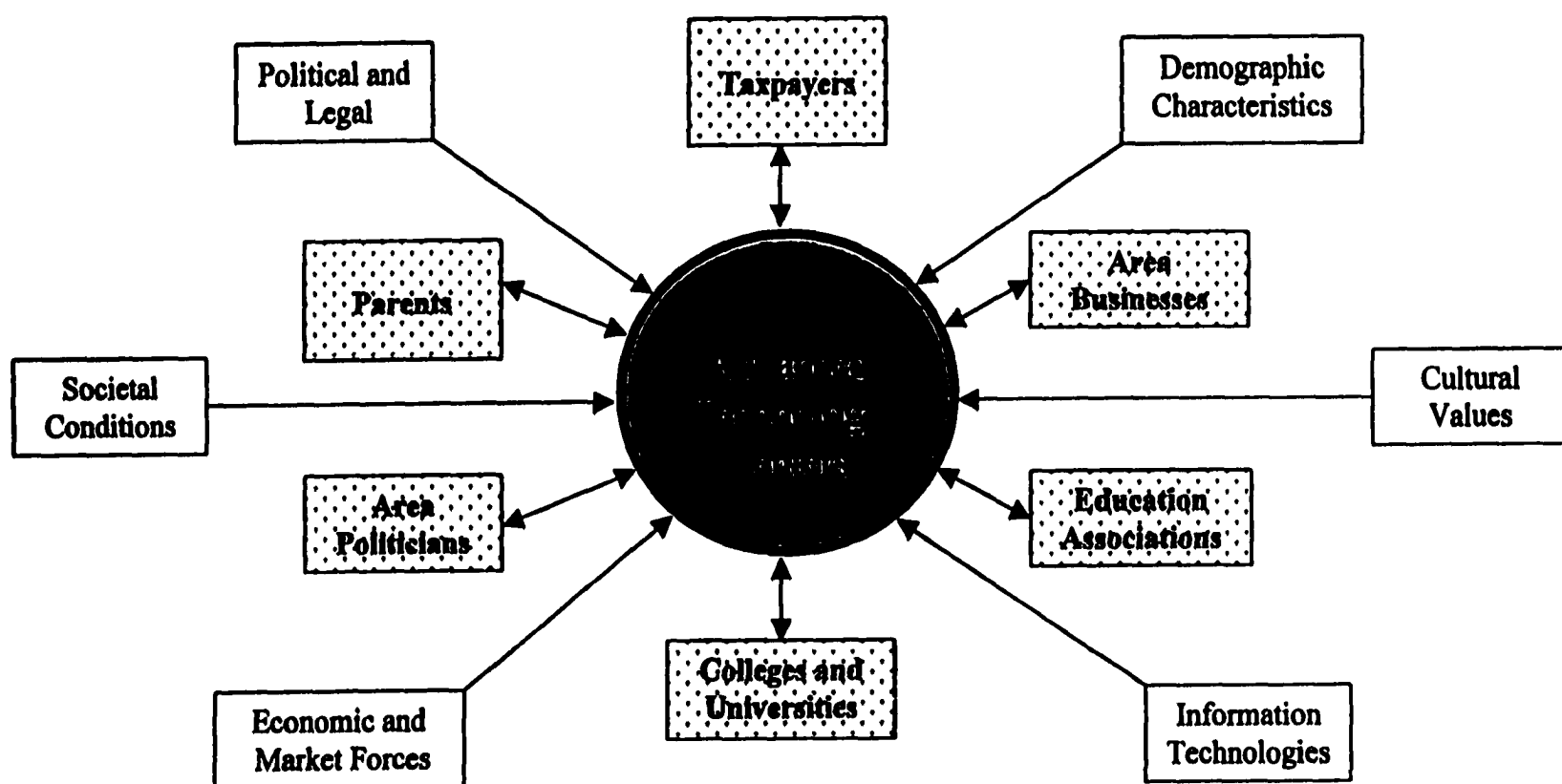


Figure 2. Selected External Environmental Constituencies of Advanced Technology Centers
Adapted from Selected External Constituencies for School Districts (Hoy & Miskel, 1996).

 Task Constituencies  General Constituencies

The information perspective views the external environment as a source of information that school decision makers, like facility administrators of urban ATCs, may use in maintaining or changing the internal structures and processes of their schools. Hoy and Miskel (1996) have grouped the information perspective under two continuums: environmental complexity (simple to complex) and environmental stability (stable to unstable).

Viewed from the environmental complexity continuum, external environmental constituencies range from simple to complex organizations or conditions. Simple external environments contain a small number of homogeneous, unlinked constituencies that exert little influence on urban ATCs. Conversely, as the external environment becomes more complex, the number, diversity, and the relationships among the constituencies increase (Daft, 1992).

The environmental stability of the external environment ranges from stable to unstable. In situations where the relationships among external environmental constituencies are constant and where conditions are either unchanging or slow to change, environmental stability occurs. Environmental instability results when both the number and type of external environmental constituencies are changing erratically (Jurkovich, 1974).

For urban ATC facility administrators, the importance of the information perspective is how environmental complexity and environmental stability combine to create an uncertain external environment. External environmental uncertainty takes place when there is insufficient information from the external environment for facility administrators to make knowledgeable decisions (Hoy & Miskel, 1996). As shown in

Figure 3, when the external environment moves from simple and stable to complex and unstable, the degree of uncertainty increases (University of Missouri, 2000). As the external environment moves from simple and stable to complex and unstable, communications between ATC facility administrators and external environment constituencies becomes less frequent and the degree of external environmental uncertainty increases.

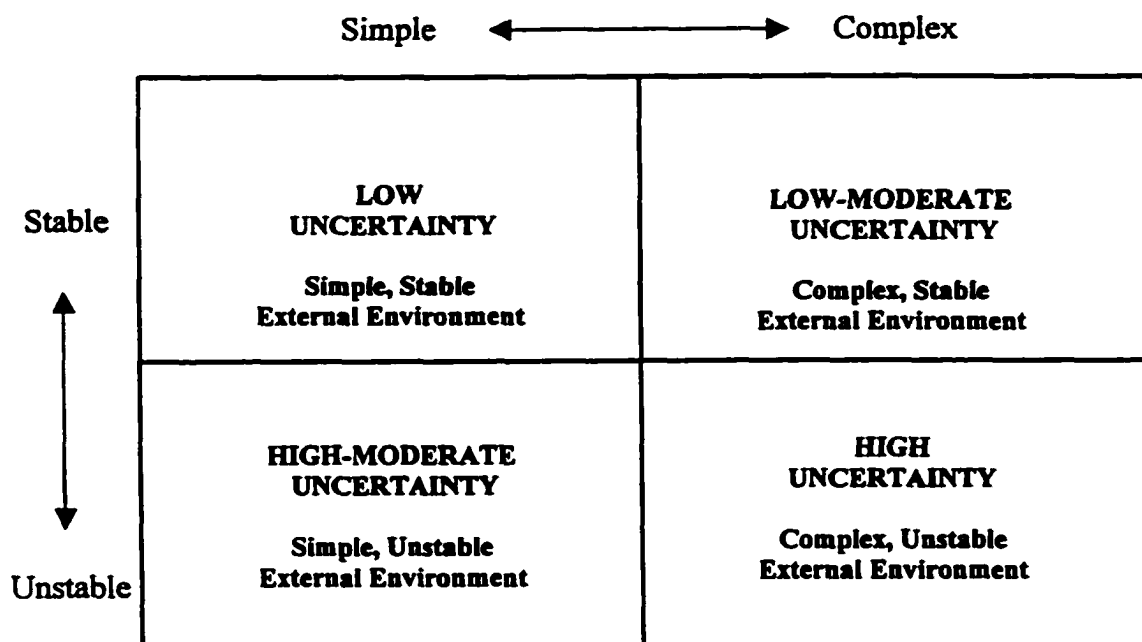


Figure 3. External Environmental Uncertainty. Adapted from Environmental Uncertainty and Organizational Responses (University of Missouri, 2000).

The resource dependence viewpoint considers the external environment as a place to gain resources for organizations. Four types of external environmental resources are

typically identified: fiscal, personnel, information and knowledge, and products and services (Aldridge, 1972; Benson, 1975). Two issues arise when considering external environmental resources: availability and dependence.

The relative availability of resources in the external environment will determine if those resources are sufficient to maintain stability and sustain growth of organizations like urban ATCs. When external environmental resources are bountiful, survival, growth, and goal attainment are unproblematic. However, when external environmental resources are limited, goal attainment and even survival may not be possible (Hoy & Miskel, 1996).

The basic idea of the resource dependence viewpoint is that if an organization is unable to generate all the resources required internally, it must enter into exchanges with constituencies in the external environment that are capable of supplying the needed assets. That is, if an urban ATC cannot accomplish its goals without the resources controlled by one or more external environmental constituencies, then the school becomes dependent on those external environmental constituencies capable of supplying the needed resources. A byproduct of resource exchanges is the development of dependencies among the external environmental constituencies and the recipient of the resources (Aldridge & Mindlin, 1978).

The institutional perspective is similar to the information and resource dependence viewpoints. Each perspective, information, resource dependence, and institutional, concentrates on organizational and external environmental relations. However, with the information and resource dependence perspectives, the focus is with the acquisition of information and resources from external environmental constituencies

by the organization. The essence of the institutional perspective is not the acquisition of something, but the conformity of organizations to the sets of rules and requirements that are imposed by legal, social, professional, and political external environmental constituencies (Hoy & Miskel, 1996). Bealings and colleagues (1996) view the institutional perspective as being relevant in understanding ATCs because conscious efforts must be made at creating and maintaining cultural endorsement in the eyes of external environmental constituencies in order to receive their continued support.

In sum, the influences of external environmental constituencies may be direct and immediate (task) or indirect and long-term (general). Three theoretical perspectives offer insightful explanations of external environmental constituencies. These perspectives are information, resource dependence, and institutional. The information perspective assumes that external environmental constituencies are sources of information to be used by organizational administrators. The resource dependence viewpoint presupposes that organizations cannot generate internally all the needed resources and that resources must come from external environmental constituencies. In contrast, the third perspective, institutional, assumes that some external environmental constituencies encourage ATCs to conform to the norms, values, and ideologies institutionalized in society (Hoy & Miskel, 1996).

Deciding which external environmental constituencies are the most relevant to urban ATCs poses complex challenges for the administrators of these facilities. Having decided which are the most relevant external environmental constituencies, urban ATC facility administrators must then decide how best to respond to these external environmental constituencies. The following section is on external management

strategies that can be used by urban ATC facility administrators to either adapt to or alter their relevant external environmental constituencies.

External Management Strategies

To access information, obtain needed resources, maintain legitimacy, and deflect undesirable effects from external environmental constituencies, schools may use various external management strategies. These external management strategies can be categorized as either internal or interorganizational. Internal management strategies attempt to help schools adapt to the influences of external environmental constituencies. In contrast, schools that make use of interorganizational external management strategies endeavor to alter their external environment constituencies. Among the internal management strategies that may be applicable to urban ATCs are buffering, planning and forecasting, boundary spanning, and adjusting internal operations. Interorganizational management strategies that may be used to modify the impact that external environmental constituencies have on urban ATCs are establishing favorable linkages and altering the external environment (Gordon, et al., 1999; Hoy & Miskel, 1996; University of Missouri, 2000).

Buffering is a strategy that creates a barrier between schools and their external environmental constituencies. The purpose of this barrier is to isolate the internal processes of schools, primarily instructional activities, from external environmental constituencies that would seek to control, constrain, or disrupt these activities. Various departments, individuals, and processes are put in place to create this buffer. At the district level, buffering might be accomplished by purchasing, planning, human resource,

and school plant departments. In the schoolhouse, one responsibility of facility administrators, specifically the principal, is to deal with the influences from external environmental constituencies (Hoy & Miskel, 1996).

Buffering strategies may be sufficient to protect instructional activities from outside influences when the condition of the external environment is simple and stable. However, when high environmental uncertainty exists, schools can attempt to manage external environmental constituencies by employing planning and forecasting strategies (Gordon, et al., 1999). According to Hoy & Miskel (1996) “planning and forecasting strategies anticipate environmental changes and take actions to soften their adverse effects (p. 214).” The object of using planning and forecasting strategies, is to identify external environmental constituencies and analyze potential trends of these organizations that are relevant to schools. Having forecasted various likely scenarios, schools then can plan in accordance with their predictions (Hoy & Miskel, 1996).

Like planning and forecasting strategies, boundary spanning is an effective strategy schools can use when coping with high environmental uncertainty (Hoy & Miskel, 1996). Boundary spanning is the process of reaching out beyond the school and attempting to link with selected external environmental constituencies (Gordon, et al., 1999; Hoy & Miskel, 1996; University of Missouri, 2000). These linking activities typically involve collecting and disseminating information. The purpose of collecting information is to provide data that enables the school to make plans or adjust current programs. Information dissemination activities are conducted to influence in a positive way the opinion that external environmental constituencies have regarding the school organization that helps schools garner support from these elements. Individuals that

conduct boundary-spanning activities for schools help to keep the school connected and in harmony with their external environmental constituencies. At the district level, public information, governmental relations, and research and development departments accomplish boundary-spanning activities. At the school building level, the principal and other facility administrators assume boundary-spanning roles (Hoy & Miskel, 1996).

According to Hoy & Miskel (1996) the most effective external management strategy is for schools to internally conform to its relevant external environmental constituencies. In other words, schools should be structured internally to be compatible with the kind, clarity, and amount of information that facility administrators receive, the availability and dependence of resources, and the mandates from society (Gordon, et al., 1999).

When the external environment contains constituencies that are stable and simple - that is to say, a low level of uncertainty exists, the internal structure of schools tends to be highly bureaucratic. Formal rules, standard operating procedures, centralized decision-making, and the inability to respond to new and unforeseen circumstances characterize these mechanistic processes. In highly unstable external environments, the internal operation of schools often is informal. Schools that operate informally contain a loosely defined hierarchy where decision making is decentralized, communication is informal, and the school is able to adapt to an uncertain external environmental (Gordon, et al., 1999; Hoy & Miskel, 1996). Hoy & Miskel (1996) posits that regardless of the overall external environmental uncertainty level that a school may encounter, because the influence from individual external environmental constituencies is diverse, a combination of internal structures and processes may be required for the survival of the organization.

While schools may adapt to the conditions posed by their external environmental constituencies, they do not have to be passive; they may attempt to alter these constituencies by use of interorganizational management strategies. Interorganizational management strategies that may be used to modify the impact that external environmental constituencies have on urban ATCs are establishing favorable linkages and altering the external environment (Gordon, et al., 1999; Hoy & Miskel, 1996; University of Missouri, 2000). Two techniques for establishing favorable linkages are forming partnerships and cooptation (Hoy & Miskel, 1996).

School districts form partnerships with a variety of public and private sector organizations in an effort to increase organizational power, reduce external environmental uncertainty, and increase performance by ensuring a constant flow of needed information and resources (Hoy & Miskel, 1996). Hinckley (1997) proposes that the mission of ATCs to increase the economic competitiveness of area business and industry, employee training and development, and provide opportunities for personal and professional growth will be carried out in part by establishing business-education partnerships. In years past, business-education partnerships usually occurred in the context of businesses donating money or equipment to schools. Presently, the concept has expanded to include such diverse activities as mentoring, tutors, career counseling, job shadowing, work placements, co-op training, field trips to places of business, school visits from representatives of the workplace, and the provision of equipment and other resources to the school (Campbell, 1999).

One method of categorizing career and technical education partnerships is to group them according to the goals of the partnership. Lankard (1995) has identified

three such groupings: classroom teaching and learning, career and technical education program development, and student work experience programs. The goal of classroom teaching and learning partnership arrangements is to expose teachers to current technology and professional practices occurring in business organizations and to assist teachers in communicating these experiences into classroom instruction. Career and technical education program development partnerships are established to develop curriculum and secure supporting instructional materials for existing or new courses. Student work experience program partnerships are formed to offer structured workplace-training opportunities that may range from a one-day job shadowing experience to a multi-year registered apprenticeship arrangement.

Cooptation is another interorganizational external management strategy germane to urban advanced technology centers in which important representatives from relevant external environmental constituencies are unofficially brought into the policy structure of the school organization (Gordon, et al., 1999; Hoy & Miskel, 1996). This strategy occurs when influential citizens are appointed to boards of education or to general advisory councils. The evidence from various studies is mixed as to how effective advisory councils are at helping schools shape or manage external environmental constituencies (Hoy & Miskel, 1996).

Altering the external environment, another interorganizational management strategy, involves two methods that can be used to modify the impact that external environmental constituencies have on urban ATCs (Gordon, et al., 1999). One method is political activity and the other is the pooling of resources in educational associations (Gordon, et al., 1999; Hoy & Miskel, 1996; University of Missouri, 2000). Political

activity is the primary method of shaping external environmental constituencies for school districts. Political activity includes techniques to influence government legislation and regulation. Related to political activity is the pooling of resources in educational associations. This technique of pooling resources by forming educational associations usually has both professional and political missions. A significant portion of the work to influence educational external environmental constituencies is accomplished jointly with other organizations that have similar interests. Individual educators or educational associations that pool resources can afford to hire people to lobby legislators to influence new regulations, promote educational agendas, and conduct public relations campaigns (Hoy & Miskel, 1996).

In reviewing external management strategies, the overall implication for facility administrators of urban advanced technology centers is that there are options available when faced with the conditions imposed by external environmental constituencies. To accommodate or alter their relevant external environment constituencies, facility administrators may use internal and interorganizational management strategies (Hoy & Miskel, 1996).

Advanced Technology Centers

Against the backdrop of influences from relevant external environmental constituencies, many urban communities are developing a new genus of career and technical education centers in order to prepare workers. The name given to this new class of career and technical education facility is advanced technology center.

Advanced technology centers are designed primarily as schools that provide instruction and training for students in the latest engineering sciences, manufacturing and industrial technologies, information technologies, and telecommunications (Tidewater Community College, 1999). Many ATCs evolved from more traditional continuing education departments. Advanced technology centers strive to determine and meet industry-specific needs for workforce development through partnerships with business and industries (Hinckley, 1997). By employing research findings, determining whether technological innovation fits local needs, and helping businesses integrate applications of technology for increased productivity and profitability, advanced technology centers help insure that technological advances are put to use in the workforce (Hinckley, 2001).

Among the common features of ATCs are specialized training laboratories, i.e., high-end computer graphics, programmable logic controls, electronics, hydraulics, flexible manufacturing work cells, open and reconfigurable training space, demonstration areas, technology theaters (auditoriums with state-of-the art audio and visual presentation equipment), meeting and seminar rooms, and administrative offices. Less common features include business incubator space and shared college and industry equipment prototyping laboratories (Hinckley, 1997).

A major distinguishing trait of ATCs is that many centers are operated so that the center brings in enough revenue to pay both direct and indirect costs of operation. Attempting to generalize an ATCs fiscal structure is difficult because each state, and often each school within a state, varies in its funding rules and applications. While modes of funding vary, there is typically an expectation that ATCs will be business-like in all operations. "As entrepreneurial units, ATCs are expected to search for new and

creative revenue sources and, as with many businesses, must anticipate the life span of its products and services” (Hinckley, 2001, p. 1). Revenue generation sources for ATCs are typically a mixture of products and services including:

- Administrative overhead added to the sale of regular credit courses and programs;
- Noncredit scheduled courses;
- Short-term training;
- Customized training;
- Seminars;
- Laboratory and facility rentals;
- Grant program overhead;
- Local and state government support (Hinckley, 2001).

Organizational models vary across the nation (Hinckley, 2001). Even within a particular model, an ATC may be operated as another division of an educational institution or it may be operated as a free entrepreneurial unit. Hinckley (1997) identified the organizational model as a significant common issue of ATCs. The reason for this designation is that the organizational arrangements may effect the purchasing restrictions and requirements, the professional relationship between ATC staff and other full-time faculty, the use of generated income, faculty pay scales, and the quality and flexibility of services used by the ATC.

The most predominate organizational model for ATCs is to operate as part of a community college (Hinckley, 1997). However, other organizational models exist such as the community college/college/university model, university model, community college/private university model, and the secondary school/college model.

The nine advanced technology centers that operate in the state of Maryland are examples of community college models. The industries that the Maryland ATCs target are: aerospace, agriculture and aquaculture, biotechnology, distribution/warehousing, health care, information technology, manufacturing, minority business, telecommunications, and tourism. Coordinated through the Maryland Higher Education Commission and the Department of Business and Economic Development, goals set for these centers are to:

- Prepare Maryland citizens for high-skill, high-wage jobs;
- Empower Maryland's businesses with the competitive edge needed to compete successfully in the nation and the world;
- Train workers where, when, and how Maryland businesses want them trained; and
- Set performance objectives for each customized training contract based on industry benchmarks, such as increased profits, productivity, and sales ((Maryland Association of Community Colleges, 2001).

In the State of Missouri, an example of a community college/college/university organizational model exists. The advanced technology center in Missouri is a cooperative effort among Linn State Technical College, Moberly Area Community College, and the University of Missouri. Located in the city of Mexico, the ATC offers five specific degree programs. These programs are Integrated Manufacturing, Practical Nursing, Computer Information Systems, Drafting, and AS/400 Program. Other courses at the ATC are offered and scheduled to suit student and private sector needs (University of Missouri, 2001).

The New Jersey Commission on Science and Technology has helped create and fund ATCs that employ a university organizational model in that state. The 10 advanced technology centers, located at major academic institutions, were designed to focus on strong industrial-academic research and design partnerships for continuous innovation to increase productivity, global competitiveness, and profits. The individual ATCs in New Jersey focus on a diverse range of industries and career areas. Those industries and career areas are food technology, hazardous substance management, biotechnology and medicine, agriculture and environment, ceramic and composite materials, fiber optic materials, photonic and optoelectronic materials, information processing, discrete mathematics and theoretical computer science, and manufacturing systems (New Jersey Commission on Science and Technology, 2001).

Representing the community college/private university organizational model is the Advanced Integrated Manufacturing (AIM) Center located in Dayton, Ohio. This partnership is between Sinclair Community College and the University of Dayton, a private Catholic institution. The objectives of the AIM Center are to:

- Improve the competitiveness of the manufacturing sector through projects, education, and training research;**
- Upgrade the skills of the manufacturing workforce and provide an opportunity for continuous learning for manufacturing practitioners; and**
- Assist companies in planning and implementing advanced manufacturing technologies, processes, and techniques (Advanced Integrated Manufacturing Center, 2001).**

The Mountainland Advanced Technology Center (MATC), Orem, Utah, is an example of a secondary school/college model. The MATC is a division of Utah Valley State College. The mission of the center is to provide training, stimulate economic development, and facilitate the creation of new jobs. Since 1990, high school juniors and seniors from a number of towns and cities have received skill training at MATC. During the 1999-2000 school year, 2,751 high school students, 10,441 adults, and 2,235 business and industry workers received customized training at MATC. Computer Repair, Novell CNA, A+, Physical Therapy, and Veterinary Assisting are among the 20 different subjects offered at the center (Utah Valley State College, 2000).

To conclude, over the past two decades advanced technology centers have come to represent a powerful factor in the nation's strategic response to the challenge of global competition and technological change. ATCs have demonstrated the capability to provide workers with a broad educational base required for job mobility and the technical skills required for new and changing roles in the workplace (Hinckley, 2001). Joining the ranks of established ATCs will be the Virginia Beach Advanced Technology Center.

Virginia Beach Advanced Technology Center

Sharing many of the characteristics of advanced technology centers nationwide, and representing a secondary school/community college organizational model, will be the Virginia Beach Advanced Technology Center, which is currently under construction. During the spring of 1997, staff from Tidewater Community College (TCC) and Virginia Beach City Public Schools (VBCPS) met and began preliminary discussions on the feasibility of the two institutions pursuing a collaborative venture to construct a career

and technical education facility. Three entities, VBCPS, the City of Virginia Beach, and TCC developed a proposal to construct the center. The Virginia General Assembly approved the proposal in 1998. The groundbreaking ceremony occurred December 11, 2000. The partners anticipate occupying the 137,000-square-foot, \$26 million-dollar building in 2002 (Tidewater Community College, 1999). The structure will be used for instructional purposes during the day by the public school division and both day and night by TCC. In addition to training space for economic development activities, the City of Virginia Beach local cable television broadcast station (Channel 48) will be housed at the new ATC. Channel 48 administrative offices will occupy 3,744 square feet of the facility. The goals of this joint project are: promote economic development in the city; meet and exceed student needs; offer flexible training and retraining for adults; and meet local labor market demands (Virginia Beach City, 1997).

Expectations from many external environmental constituencies for the Virginia Beach ATC are high. “We are ecstatic about the uniqueness of this joint project and the tremendous potential this partnership represents,” said Virginia Beach Mayor Meyera Obendorf at the premier screening of a virtual tour of the Virginia Beach ATC held October 7, 1999. Another attendee of the virtual tour, United States Representative Edward L. Schrock said of the ATC, “It’s going to draw a lot of businesses that might otherwise not come here. It will pay for itself many, many times over” (Sinha, 1999). In the *Final Report – Economic Development: Department of Economic Development City of Virginia Beach* (Virginia Beach City, 2000), the Virginia Beach ATC is cited as a central strategic element. Listed among the recommendations that will constitute the city’s economic development strategy over the next decade is for the Department of

Economic Development to promote the ATC as the icon of economic development, the centerpiece for high-tech discussions, as well as a showplace for business-oriented innovations. Having a thoroughly-planned economic development strategy was cited as one of the reasons why in June, 2001, the City of Virginia Beach had its bond rating raised to AA-plus, the second highest grade possible and the city's highest grade ever ("Flotsam and Jetsam," 2001).

Among the numerous noteworthy features of the Virginia Beach ATC is its location. The center is being constructed in the most populous city in the Commonwealth of Virginia. Virginia Beach is the 38th largest city in the United States with a population of 425,257 citizens (2000). By the year 2010, population is projected to surpass 575,000. The Central Business District (CBD), located in the Pembroke Area, encompasses 500 acres and 1.9 million square feet of mid-rise and high-rise office space. Currently, another 25 acres are under development in the CBD that will produce 850,000 square foot of Class A office space, 750,000 square foot of upscale retail, luxury hotel and apartments and parking (Virginia Beach City, 1997, 2001).

Populous cities require proportionately large school systems. The Virginia Beach City Public School system is comprised of 55 elementary schools, 15 middle schools, and 14 high schools. Over 77,000 students were served during the 2000-2001 school year in grades K-12 of which 19,806 were technical and career education students. With the completion of the Virginia Beach ATC, the City of Virginia Beach will earn yet another distinction. There are 10 jointly operated and 44 solely owned career and technical education centers serving 83 school divisions in Virginia (Virginia Department of Education, 1999). When the Virginia Beach ATC begins operation, Virginia Beach will

become the only school division in the state with two technical and career education centers.

Another notable feature of the center is its location within the city. The Virginia Beach ATC site is contiguous to the main TCC Campus and the recently completed Old Dominion University/Norfolk State University (ODU/NSU) complex and can share common resources and infrastructure. The existing Landstown Middle School and Landstown High School, a technology magnet high school that opened September 2001, are located across the street. These adjoining entities, the Virginia Beach Higher Education Center, the Virginia Beach Campus of TCC, Landstown Middle School, Landstown High School, and the ATC will create an academic village (Virginia Beach City Public Schools, 1999). The Virginia Beach ATC literally will be the center, both sequentially and geographically, of this learning conglomerate.

To meet the training needs of the local businesses, a 4,000 square foot Virginia Beach Workforce Training Center will be housed within the Virginia Beach ATC. This training center will provide new and existing businesses within the city a facility to conduct skills training or retraining classes for their employees. The training center will be divided into two distinct areas, each with different capabilities. Training Room I will be equipped with computer desks, white board, projector, and data drops, and will accommodate as many as 25 persons for instruction. Training Room II will be wired with data drops for up to 75 persons. Since this room will not have installed desks or carpeting, clients will be able to use it for training on larger equipment (Virginia Beach City, 2001).

The Virginia Beach ATC also will contain a multi-use space called the Technology Theatre that will house a state-of-the-art theater that will allow communication to extend beyond the facility walls to anywhere in the world. With appropriate planning and utilization, the Technology Theater can transform from a multi-purpose meeting space, into an origination or a receiving site for videoconferences, teleconferences, satellite broadcasts, or webcasts. The rear of the auditorium-style space may be partitioned to accommodate smaller instructional and meeting needs. The Technology Theatre will allow the center to have a conference capacity for 400 that will be used by the school system, community college, economic development, local businesses, and community organizations (Tidewater Community College, 1999).

The Virginia Beach ATC will be an official Authorized Prometric Testing Center location offering industry-certified examinations, including: A+, Microsoft Certified Professional (MCP), Novell Computer Network Administrator (CNA), Cisco Certified Networking Associate (CCNA), Microsoft Certified Service Engineer (MCSE), and Microsoft Office User Specialist (MOUS). Of the twenty secondary school level courses to be offered at the center, ten will prepare students to sit for one or more industry-certified examinations. Of the twelve post secondary level courses to be offered at the center, eight will prepare students to sit for one or more industry-certified examinations (Tidewater Community College, 1999; Virginia Beach City Public Schools, 2001).

At the secondary school level, Virginia Beach City Public Schools will offer advanced technology center programs for high school students with opportunities for articulation and dual enrollment at Tidewater Community College. The curriculum will focus on three broad program areas: information technology, telecommunications, and

high performance manufacturing (Virginia Beach City Public Schools, 2001). Courses proposed for high school students attending the Virginia Beach ATC are listed below.

Information Technology Program Area

Microsoft Windows and Visual Basic

Computer Network Administrator/Computer Network Engineer

Digital Design

Oracle Internet Academy

Cisco Networking Academy

Electronic Commerce

A+ Computer Repair

i-Net+

Telecommunications Program Area

Telecommunications

High Performance Manufacturing Program Area

Auto CAD/Drafting and Design

Modeling and Simulation

Engineering Principles I

Engineering Principles II

Computer Integrated Manufacturing (CIM)

Programmable Logic Control (PLC)

Engineering Materials

Total Quality Management

Statistical Process Control

Case Study

Engineering Research (Virginia Beach City Public Schools, 2001).

At the post secondary school level, Tidewater Community College will offer courses at the Virginia Beach ATC that will focus on two occupational program areas: business and marketing and engineering and industrial technology (Tidewater Community College, 1999). Courses proposed for post secondary students attending the Virginia Beach ATC are listed below.

Business and Marketing

Microsoft Network Technician

Computer Network Administrator/Computer Network Engineer

A+ Computer Repair

Database

Programming Languages (Visual Basic, C++, Java)

Internet Specialist Offerings

Software Applications

Small Business Support Applications

Engineering and Industrial Technology

A+ Computer Repair

Engineering

Manufacturing

AS/400 Business and Industry Partnership (Tidewater Community College, 1999).

When the Virginia Beach Advanced Technology Center opens in 2002 it is poised to offer a unique array of career and technical training opportunities. The location of the

center in the “academic village” of the City of Virginia Beach, coupled with the unusual pairing of secondary, post secondary, and economic development training spaces, and the state-of-the-art facilities place the Virginia Beach ATC in a position to be a national career and technical education model (Virginia Beach City, 1997).

Summary

The problem addressed in this study was to determine are the most relevant external environmental constituencies and how facility administrators of urban advanced technology centers should respond to these external environmental factors. Related to this problem, a review of the literature of system theory, external environment, internal and interorganizational management strategies, and an analysis of advanced technology centers, including the Virginia Beach Advanced Technology Center, was presented.

Systems theory has been in use for more than fifty years as a model for helping organizations, such as schools, improve effectiveness. External environment is an element of an open-system model. External environments can be categorized as either task or general environments (Harrison, 1994; Hoy & Miskel, 1996). Three theoretical perspectives help to explain the influences of external environmental constituencies upon urban ATCs. The information perspective assumes that external environmental constituencies are sources of information to be used by facility administrators. The resource dependence viewpoint presupposes that organizations cannot generate internally all the needed resources and that resources must come from external environmental constituencies. In contrast, the third perspective, institutional, assumes that some

external environmental constituencies encourage ATCs to conform to the norms, values, and ideologies institutionalized in society (Hoy & Miskel, 1996).

To access information, obtain needed resources, maintain legitimacy, and deflect undesirable effects from external environmental constituencies, schools may use various external management strategies. These external management strategies can be categorized as either internal or interorganizational. Internal management strategies attempt to help schools adapt to the influences of external environmental constituencies. Internal management strategies that may be applicable to urban ATCs are buffering, planning and forecasting, boundary spanning, and adjusting internal operations. Schools that make use of interorganizational external management strategies endeavor to alter their external environment constituencies. Interorganizational management strategies that may be used to modify the impact that external environmental constituencies have on urban ATCs are establishing favorable linkages and altering the external environment (Gordon, et al., 1999; Hoy & Miskel, 1996; University of Missouri, 2000).

Many urban communities are developing a new kind of career and technical education center to prepare workers; these are advanced technology centers. Advanced technology centers are designed primarily as regional resources for shared instruction and training of students in the latest engineering sciences, manufacturing and industrial technologies, information technologies, and telecommunications (Tidewater Community College, 1999). Virginia Beach, Virginia, is scheduled to open an advanced technology center in 2002.

With the pressure from a profusion of task and general external environmental constituencies, perhaps the greatest challenge for facility administrators of urban

advanced technology centers is to determine the extent to which the school can, should, or must respond to the multitude of environmental demands (Hoy & Miskel, 1996). The following chapter will explain the methods employed by this study to provide information that will aid facility administrators of urban ATCs in meeting this challenge.

CHAPTER III

METHODOLOGY

The objective of this chapter is to describe the methods and procedures used to answer the research questions proposed by this study. Included in this chapter are explanations of the following topics: research design, Delphi panel, instruments, data analysis, and summary.

Research Design

In this study, a three-round Delphi research method was conducted to determine the parameters of the external environment of urban advanced technology centers as perceived by facility administrators who operate these centers. The Delphi method provided a systematic process of soliciting and collating perceptions of the external environment constituencies of urban advanced technology centers by presenting questionnaires to the same group of participants over several iterations.

The Delphi method consists of a series of questionnaires, of which the second and succeeding rounds feed back information to the participants while giving them a chance to rethink, react, and, if necessary, to restate their opinions in light of the feedback from the entire panel. Dalkey and Helmer (1963), the pioneers of the Delphi method, claimed that this type of controlled interaction avoided many of the disadvantages common to the more conventional use of round table discussions. The Delphi method does not force the participant to follow the majority, but instead it provides a statistically based reason for consideration. A schematic rendering of the Delphi method is presented in Figure 4.

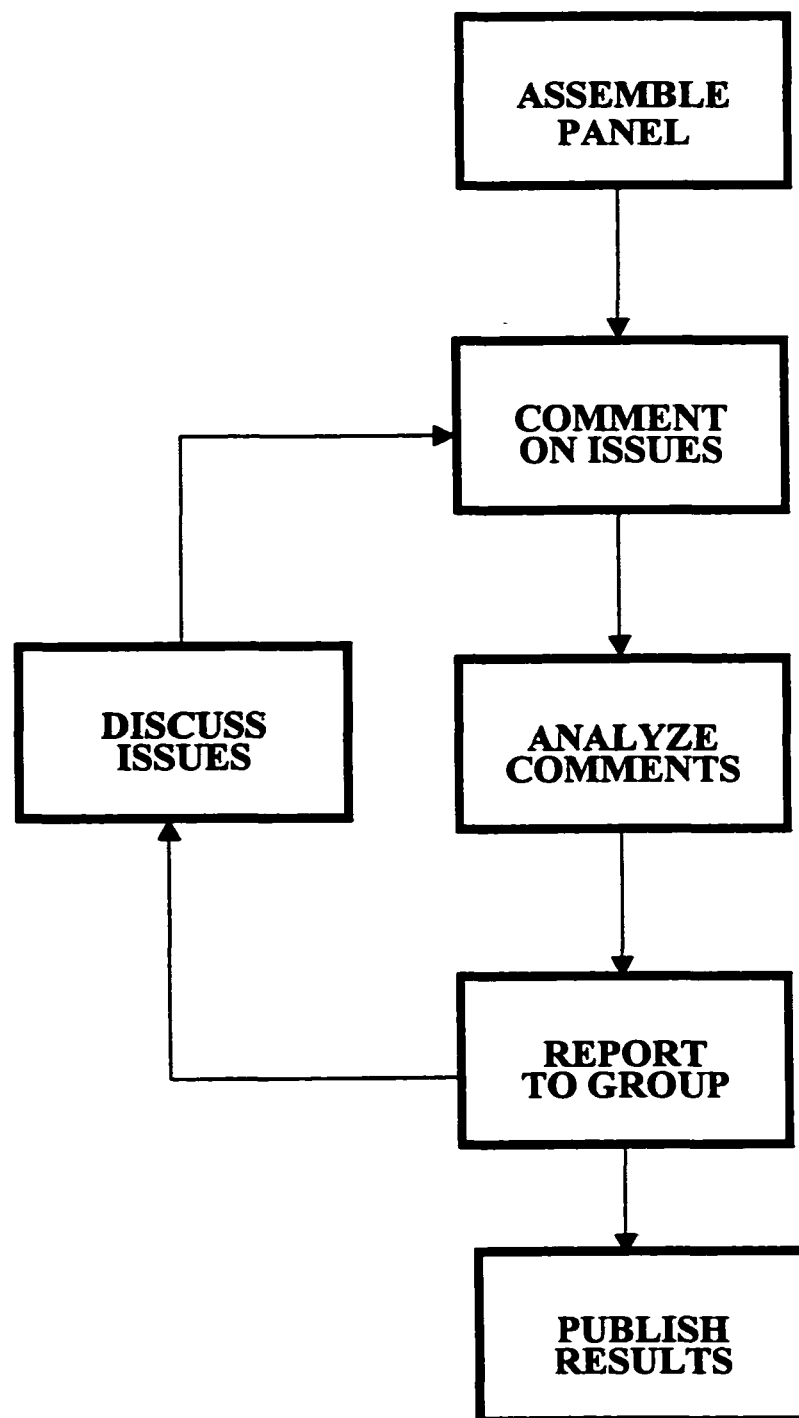


Figure 4. The Delphi Method (Linstone & Turoff, 1975).

Delphi Panel

The expert panel for this study included facility administrators from urban advanced technology centers throughout the United States. According to Leirman (2000, p. 7), “The very essence of a Delphi survey is the careful selection of expert respondents.” One of the distinguishing features of the Delphi method is that representative “random samples” are not used. Persons are selected based upon their experience in and who are deemed knowledgeable about the issue under study. To be succinct, the term “panel participant”, instead of “sample”, was used in this study.

A total of 17 members of the President’s Advisory Council and the Board of Directors of the National Coalition of Advanced Technology Centers (NCATC) were asked to nominate three possible expert participants (Appendix A). The NCATC functions as a network of mutual support to help ATCs achieve their fullest potential as mechanisms for technology application, education, and training. With member facilities and equipment valued at more than \$600 million, the NCATC reaches out to help institutions use its significant investment in human and capital resources (Hinckley, 2001). A list of NCATC member institutions and their locations is provided in Appendix B.

Regarding the number of expert panel participants, Millholland and colleagues (1973) suggested that the optimum respondent group size is 13 individuals. Experiments by Brockhoff (1975) suggest that under ideal circumstances, groups as small as four can perform well. Delbecq and colleagues (1975) suggest 10 to 20 is the ideal range for a homogeneous group and that few new ideas are generated once the group exceeds 30 well-chosen participants. There were nine expert panelists that participated in this study.

The group interaction in this process was protected, in the sense that comments and answers were not identified as to their originator and were presented to the group in such a way as to suppress any identification.

Demographic information was requested from the expert panelists. This information revealed that the majority of the panelists are in their fifties and have obtained a doctoral degree. With the exception of one community college president, panelists listed their job title as either dean or director. Of the nine expert panelists, eight has worked in career and technical education for more than 11 years, with 33 percent possessing more than twenty years of experience in CTE.

Instruments

Three Delphi questionnaires used in this study were developed prior to beginning the first Delphi round. Each questionnaire was detailed and refined further as results of the previous round were analyzed.

An introductory letter explaining the purpose and an overview of the Delphi process, along with Round I, were mailed May 14, 2001, with a requested return date of May 28, 2001 (Appendix C). The Round I questionnaire posed two broad questions (Appendix D). The first question asked the expert panelist to identify the external constituencies of urban advanced technology centers that were relevant to goal setting, goal achievement, effectiveness, and survival. The second question asked, as a facility administrator of an urban advanced technology center, what, if any, action does the identified external constituencies generate? Figure 1, ATC Constituencies, and an Informed Consent Document were also enclosed in the first mailing (Appendix E).

The purpose of Delphi Round II was to reflect to expert panelists the external environmental constituencies that had been identified in Round I and to determine their level of agreement with the list (Appendix F). The list of external environmental constituencies and corresponding administrative comments from the first round was presented and each expert panelist was asked to rate the listed external environmental constituencies on a five-point Likert style scale. A demographic information form was also included with this mailing (Appendix G). As with Delphi Round I, the questionnaire ended with instructions for return.

Delphi Round III served to gain further agreement on relevant external environmental constituencies (Appendix H). The group perceptions from the second round along with each individual's responses were offered. The respondents then were asked to review their ratings on the same Likert style scale with consideration given to the group responses. Expert panelists were provided space on the form and encouraged to explain any rankings that differed significantly from those of the group.

Data Analysis

Typically, the Delphi method is considered a qualitative procedure (Linstone & Turoff, 1975). Therefore, as with most studies applying the Delphi method, both descriptive and ordinal statistics were used to relate findings from previous rounds back to panel participants (Miller & Rojewski, 1992; Rogewski & Meers, 1991; Volk, 1993; Wicklein, 1992, 1993).

Analysis of the data relied on several descriptive statistics to measure panel consensus including median, interquartile range, and rank order. The median has been

found to be the most accurate statistical descriptor of a panel's responses. In Delphi studies, the median better reflects the opinion of every member (Dalkey, 1968). The interquartile range was used to gauge the consensus of the group (Rose, et al., 1991). For this study, consensus was defined as an interquartile range (IQR) score equal to or less than 1.00.

Round I was intended to induce numerous perceived external environmental constituencies and corresponding facility administrators' comments. Three specialists, each representing an institution that will be housed in the Virginia Beach ATC, grouped the facility administrators' comments in an accurate and unbiased manner (Appendix I). The researcher acted as facilitator for this process.

The data from the second round were in the form of Likert style five-point responses. This information was analyzed to establish the median and interquartile range for each of the external environmental constituencies gathered from the first round. This analysis was conducted with the assistance of the computer software Statistical Package for the Social Sciences (SPSS), Version 6.1.

The data from the third iteration was treated in the same manner as the second round data in order to derive a final median measurement and interquartile range score for each of the external environmental constituencies. These statistical data were textured with the qualitative rationale provided by respondents whose individual rankings fell below the 25th percentile or above the 75th percentile of the group.

The panel-developed relevant external environmental constituencies were placed in rank order by the magnitude of their median score after Round III. Whether the panel achieved consensus regarding the ranking of each external environmental constituency

also was cited. The external environmental constituencies then were grouped as to either task or general external environment.

To answer research question 3, external management strategies were identified that facility administrators of urban advanced technology centers should use to either adapt to or alter their relevant external environmental constituencies (Gordon, et al., 1999; Hoy & Miskel, 1996; University of Missouri, 2000). These external management strategies may be categorized as either internal or interorganizational. Internal management strategies that urban ATCs facility administrators should use are planning and forecasting, boundary spanning, and adjusting internal operations. Interorganizational management strategies that should be used to modify the impact that external environmental constituencies have on urban ATCs are establishing favorable linkages and altering the external environment (Gordon, et al., 1999).

Summary

In this study, a three-round Delphi research method was conducted to garner the external environmental constituencies of urban advanced technology centers. The President's Advisory Council and Board of Directors of the National Coalition of Advanced Technology Centers were asked to nominate prospective expert panelists based upon their experience and who were deemed knowledgeable about the issue under study. The expert panel participants for this study included facility administrators from urban advanced technology centers from throughout the United States.

Chapter IV examines the results of the Delphi analysis. This examination relied on several descriptive statistics to measure the Delphi panel consensus including median,

interquartile range, and rank order. Figures, tables, and comments from the expert panelists are utilized to present aspects of this analysis.

CHAPTER IV

FINDINGS

This Delphi study was conducted from May 14, 2001, until July 31, 2001. Its purpose was to develop a list of the most relevant external environmental constituencies and suggested responses to those external environmental constituencies that facility administrators of urban advanced technology centers should use. The President's Advisory Council and Board of Directors of the National Coalition of Advanced Technology Centers nominated facility administrators of urban advanced technology centers (n=17) to participate in this study. First-round surveys were sent to the 17 nominated administrators; nine agreed to participate in the study. The response rate was 53 percent of the nominated group. All expert panelists were employed at urban facilities that hold current membership in the National Coalition of Advanced Technology Centers (NCATC). Detailed demographic information about the panel of experts is contained in Appendix G. These nine expert panelists comprised more than eight percent of the 123 member NCATC. All nine expert panelists participated in each of the three rounds of questioning. Follow-up letters, electronic mail messages, and telephone calls were used to encourage participation.

Round I Results

The first survey sent to the nine expert panelists asked that they answer two broad questions. The first question asked them to identify the external constituencies of urban advanced technology centers that were relevant to their goal setting, goal achievement, effectiveness, and survival.

The second question asked that as a facility administrator of an urban advanced technology center what, if any, action does the identified external constituencies generate? Appendix J provides a list of the responses received from Round I. The responses were recorded exactly as written by the panel members.

Three specialists in the area of economic development, marketing, and community college occupational and technical programs analyzed the responses from the first round survey. When the Virginia Beach ATC facility opens, all three specialists will work in the center. The economic development specialist will schedule training for private sector organizations. The marketing specialist will teach the secondary course electronic commerce for Virginia Beach City Public Schools. The community college occupational and technical programs specialist will coordinate all the Tidewater Community College programs offered at the Virginia Beach ATC.

The review of the Round I results by the three specialists resulted in a condensed list of 14 external environmental constituencies and accompanying explanations. This list of external environmental constituencies appeared in Round II and III where panelists were asked to rate each according to their relevance to urban ATCs. The following list displays those final 14 external environmental constituencies:

1. Accrediting Agencies - Provide a framework of rules that ATCs must operate within. May be an impediment to adapting to rapid changing employer training needs.
2. Area Business - Meeting the training needs of the local businesses are ATCs primary focus. As employers they are really the "customers" of ATCs products (students). ATCs should set goals with area businesses in mind. Good ATC

planning will include a strong degree of input from the local business and industry representatives. When area business and industry do not value educational partnerships, the information exchange and internal financial support suffer.

3. Area Politicians - Must understand the importance of the ATC so they can help direct funding and other external support.

4. ATC Cultural Values - The commitment is to be customer-focused. The commitment is to be responsive to business needs and to respond quickly to those needs. The commitment is to providing business training and assistance at a "better, faster, and cheaper rate."

5. Cultural Values - Impacting student recruitment is the perception that a liberal arts education is better than technical training.

6. Current Workers - Identifying the training needs of current employees is an area that is of great concern to ATC building administrators.

7. Demographics - Responding to significant growth in minority and international populations in an ATC service area may require the provision of additional services such as English as a second language courses.

8. Economic Development Organizations - The services provided by ATCs can be one of the most important forces attracting new businesses to a region. In turn, the industries that are attracted to a region by an economic development organization may drive the programmatic offerings of the ATC.

9. Economic/Market Forces - The ebb and flow of employers' training requests are a by-product of business trends. Some ATCs were designed and developed during a time when industry was contracting, while others were designed during

the Internet explosion. In general, market forces are the key factor in the overall strength of our ATC business.

10. Information Technologies (IT) - So much of what ATCs do involves computers and information technology. ATCs must maintain state-of-the-art programs and must scrutinize the developments of the information technology industry.

11. Legislatures - Political/legal - An important external constituency is state legislatures, since they determine the level of funding for ATCs. Technology changes so fast that maintaining current programs, both from a human resources and an equipment standpoint, is difficult without sufficient funding from the state legislature.

12. Other Educational Organizations - Public/private - There are several ways to view other educational organizations. As an external partner, it is important that they understand articulation and transfer options of ATC students. As external competition, it is important to know what courses they are offering. Competition drives much of our energies – pricing, program development, packaging/delivery, marketing, quality control, customer service, etc.

13. Parent College or Organization - How the parent college or organization views the ATC and how the ATC is incorporated within the whole college mission is critical. So that the ATC is not seen as a competing element to the standard/traditional education services, how the parent college goes about the planning and developing phase of the ATC is critical to its future acceptance and success. The organization of many community colleges has the ATC outside the

“normal” academic unit. It is, therefore, a separate unit, and often it is considered a “profit-center.” This designation sets up an external constituency known as “the rest of the college.” Parts of the college look at the ATC as competition; parts of the college look at the ATC as collaborators; still others have no idea why it exists. This may be the most critical constituency to the ATCs survival. This constituency needs the most communication; this constituency needs the most relationship building; this constituency needs the most knowledge about what the ATC is doing.

14. Taxpayers - Many taxpayers expect ATCs to provide higher quality services without additional tax increases.

Of the 14 external environmental constituencies identified by the panel of experts in the first Delphi round, eight may be classified as task environment, which include the external organizations and conditions that are related directly to a center’s main operation. The task environmental constituencies identified were accrediting agencies, area business, area politicians, current workers, economic development organizations, other educational organizations - public/private, parent college or organization, and taxpayers. The remaining six external environmental constituencies may be classified as general external environmental constituencies, which include institutions and conditions having infrequent or long-term impacts on the organization and its task environment. The general external environmental constituencies identified were ATC cultural values, cultural values, demographics, economic/market forces, information technologies (IT), and legislatures - political/legal (Harrison, 1994; Hoy & Miskel, 1996).

Round II Results

The second round survey was sent to the nine expert panel members with a request to rate the 14 external environmental constituencies developed by the panel in Round I. Each expert panelist was sent the Round II cover letter and questionnaire both by e-mail and by traditional mail with instructions to return the questionnaire by the means they preferred. All nine expert panelists returned their questionnaires. The majority, 66.7 percent, returned the survey instrument via e-mail. The following Likert style five-point scale appeared on the Round II and III questionnaires:

1. Irrelevant to goal setting, goal achievement, effectiveness, and survival.
2. Limited relevance to goal setting, goal achievement, effectiveness, and survival.
3. Moderate relevance to goal setting, goal achievement, effectiveness, and survival.
4. Significant relevance to goal setting, goal achievement, effectiveness, and survival.
5. Most relevant to goal setting, goal achievement, effectiveness, and survival.

For each external environmental constituency, a group median was calculated. Although the raw scores for the initial rating of the external environmental constituencies varied from 1 to 5, the median scores ranged from 2 to 5. Only two of the 14 external environmental constituencies identified in Round I were rated as having limited relevance, three possessed moderate relevance, seven significant relevance, and two items, area business and ATC cultural values, were rated the most relevant to goal setting, goal achievement, effectiveness, and survival of urban ATCs.

The external environmental constituency taxpayers possessed the greatest interquartile range score of 2.5. The external environmental constituency area business contained 0 interquartile range; all nine expert panelists gave this external environmental constituency a rating of 5.0. Appendix K contains the results of the calculations undertaken from the of Round II questionnaire. Table 1 represents those calculations.

TABLE 1

Round II Median and Interquartile Range Scores		
<u>Median</u>	<u>IQR</u>	<u>External Constituencies</u>
5	0	Area Business
5	0.5	ATC Cultural Values
4	0.5	Economic Development Organizations
4	1.0	Economic/Market Forces
4	1.0	Information Technologies (IT)
4	1.0	Current Workers
4	1.5	Parent College or Organization
4	1.5	Demographics
4	2.0	Legislatures - Political/legal
3	1.0	Area Politicians
3	1.0	Cultural Values
3	0.5	Other Educational Organizations - Public/private
2	1.0	Accrediting Agencies
2	2.5	Taxpayers

Round III Results

The Round III survey provided each of the nine expert panelists with a duplicate copy of the 14 external environmental constituencies derived from Round I (Appendix J). In this round, each external environmental constituency was preceded with the median rating for all respondents, their individual first ratings, and the lower quartile and the

upper quartile scores for each. Respondents were asked to again rate each of the external environmental constituencies with consideration given to the scores provided. The panel of experts were instructed that if their final rating for an external environmental constituency was not congruous with the group as a whole to note the external environmental constituency and provide a brief explanation of why his or her varied from the responses of other panel members.

All nine expert panelists responded to the third and final round. As with the Round II questionnaires, six of the nine were transmitted by e-mail. The median rating and interquartile range scores for each of the 14 external environmental constituencies was calculated based upon the responses from Round III. The results of the calculations for the final round are contained in Appendix L.

The median scores remained the same for each of the 14 external environmental constituencies as in Round II with one exception, legislatures - political/legal. This constituency dropped one integer from 4 to 3. This downturn in the median score of legislatures – political/legal indicated a change in the perception by the panelist of the relevance of the external environmental constituency – from significant to moderate. In the final analysis, 12 of the 14 external environmental constituencies identified by the panel of experts were rated as either moderate, significant, or the most relevant to goal setting, goal achievement, effectiveness, and survival of ATCs. The median scores from Round III are listed in Table 2.

While the amount of change in median scores from Round II to Round III was limited to one external environmental constituency, as Table 3 displays, there were four changes in the interquartile range scores. Indicating movement towards greater

TABLE 2

Round III Median Scores and Changes from Round II		
Median	Change	External Constituencies
5	0	Area Business
5	0	ATC Cultural Values
4	0	Economic Development Organizations
4	0	Economic/Market Forces
4	0	Information Technologies (IT)
4	0	Current Workers
4	0	Parent College or Organization
4	0	Demographics
3	-1	Legislatures - Political/legal
3	0	Area Politicians
3	0	Cultural Values
3	0	Other Educational Organizations - Public/private
2	0	Accrediting Agencies
2	0	Taxpayers

consensus by the expert panelists, the IQR range decreased by 0.5 for the ATC cultural values, demographics, and accrediting agencies. The IQR for the external environmental constituency taxpayers decreased to 1.0.

Consensus on the relevance of external environmental constituencies was assumed according to the expert panelists' interquartile range scores. For this study, consensus was defined as an IQR score equal to or less than 1.00. There were eleven external environmental constituencies where the panelists gained consensus: area business, ATC cultural values, economic development organizations, economic/market forces, information technologies (IT), current workers, demographics, area politicians, cultural

TABLE 3

Round III Interquartile Range Scores and Change from Round II		
IQR	Change	External Constituencies
0	0.0	Area Business
0.5	0.5	ATC Cultural Values
0.5	0.0	Economic Development Organizations
1.0	0.0	Economic/Market Forces
1.0	0.0	Information Technologies (IT)
1.0	0.0	Current Workers
1.5	0.0	Parent College or Organization
1.0	0.5	Demographics
2.0	0.0	Legislatures - Political/legal
1.0	0.0	Area Politicians
1.0	0.0	Cultural Values
0.5	0.0	Other Ed. Organizations - Public/private
0.5	0.5	Accrediting Agencies
1.5	1.0	Taxpayers

values, other educational organizations - public/private, and accrediting agencies.

Consensus among the panel of experts was not achieved regarding parent college or organization, legislatures - political/legal, nor taxpayers.

Summary

This study identified the external environmental constituencies of urban advanced technology centers as perceived by an expert panel of ATC facility administrators that are relevant to goal setting, goal achievement, effectiveness, and survival. Through utilization of the Delphi method, this was accomplished without the bias and pressures frequently associated with group consensus building (Delbecq, Van de Ven, & Gustafson, 1975).

From the 17 facility administrators of urban ATC's nominated, nine agreed to participate as expert panelists for this study. In Round I, panelists were asked two open-ended questions. From the answers to the Round I questions, a condensed list of 14 external environmental constituencies were developed. In Round II, the list of 14 external environmental constituencies were sent to the panel of experts with instructions to rate their perceived relevance to goal setting, goal achievement, effectiveness, and survival of urban ATCs on a five point Likert style scale. A third-round questionnaire was sent to all expert panelists with instructions to again rate the list of 14 external environmental constituencies in light of the group median scores and their original rating. Of the 14 external environmental constituencies, eight may be classified as task environment or those external organizations and conditions that are directly related to a school's main operation. The remaining six were classified as general environment or those outside institutions and conditions having infrequent or long-term impacts on a school's operation (Harrison, 1994; Hoy & Miskel, 1996). Consensus was achieved for 11 of the 14 external environmental constituencies. Of the 14 external environmental constituencies, 12 were rated as moderate, significant, or most relevant to goal setting, goal achievement, effectiveness, and survival of ATCs.

In the final chapter of this study, the research will be summarized and conclusions from the findings will be drawn. The third research goal, "How should facility administrators of urban advanced technology centers respond to the identified relevant external environmental constituencies?" will be addressed. Recommendations for further research also will be offered.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Urban advanced technology centers (ATCs), which are designed to prepare students to meet specific employment needs of the community, have an inherent obligation to identify and administratively internalize both immediate and long-term external environmental constituencies. Immediate or task external environmental constituencies are all the external organizations and conditions that are related directly to a school's main operation. Task external environmental constituencies may include parents, taxpayers, regulatory agencies, local employers, legislatures, accrediting agencies, educational associations, local politicians, colleges and universities, local churches, local media, and collaborative partners. Long-term or general external environmental constituencies are institutions and conditions having infrequent impacts on the organization. Research had not reported how facility administrators of established urban advanced technology centers have defined the parameters of the external environment and guided subsequent responses to it. Included in this chapter is a summary of the study, conclusions drawn from the findings, and recommendations for further research and action on the part of facility administrators of urban advanced technology centers.

Summary

The issue addressed in this study was to determine the relevant external environmental constituencies and how facility administrators of urban advanced technology centers should respond to these forces. Related to this problem, a review of the literature on system theory, the external environment, external management

strategies, and an analysis of advanced technology centers, including the Virginia Beach Advanced Technology Center, was presented.

Many urban communities are developing a new kind of career and technical education center to prepare workers; these are called advanced technology centers. Advanced technology centers are designed primarily as regional resources for shared instruction and training of students in the latest engineering sciences, manufacturing and industrial technologies, information technologies, and telecommunications (Tidewater Community College, 1999). The City of Virginia Beach, Virginia Beach City Public Schools, and Tidewater Community College are constructing an ATC that is scheduled to open in 2002.

Systems theory has been in use for more than fifty years as a model for helping organizations, such as schools, improve effectiveness. Scott (1992) asserts that the central understanding emerging from open-systems theory is that all organizations are incomplete and depend on exchanges with other organizations in the environment as a condition of their survival. External environment is an element of an open-system model. External environmental constituencies can be categorized as either task or general (Harrison, 1994; Hoy & Miskel, 1996). Three theoretical perspectives help to clarify the influences of external environmental constituencies upon urban ATCs. The information perspective assumes that external environmental constituencies are sources of information to be used by facility administrators. The resource dependence viewpoint presupposes that organizations cannot generate internally all the needed resources and that resources must come from external environmental constituencies. In contrast, the third perspective, institutional, assumes that some external environmental constituencies

encourage ATCs to conform to the norms, values, and ideologies institutionalized in society (Hoy & Miskel, 1996).

To access information, obtain needed resources, maintain legitimacy, and deflect undesirable effects from external environmental constituencies, schools may use various external management strategies. These external management strategies can be categorized as either internal or interorganizational. Internal management strategies help schools adapt to the influences of external environmental constituencies. Schools that make use of interorganizational external management strategies endeavor to alter their external environment constituencies. Internal management strategies that are applicable to urban ATCs are planning and forecasting, boundary spanning, and adjusting internal operations. Interorganizational management strategies that can be used to modify the impact that external environmental constituencies have on urban ATCs are establishing favorable linkages and altering the external environment (Gordon, et al., 1999; Hoy & Miskel, 1996; University of Missouri, 2000).

This study was designed to develop a communication process that would clarify the exchanges that urban advanced technology centers have with external environmental constituencies and thus address the following research questions:

1. What external environmental constituencies of urban advanced technology centers are relevant to goal setting, goal achievement, effectiveness, and survival?
2. Of the identified external environmental constituencies, which are considered the most relevant?
3. How should facility administrators of urban advanced technology centers respond to the identified relevant external environmental constituencies?

This investigation involved assembling a nominated panel of facility administrators of urban advanced technology centers (n=9). All panel members maintained full participation throughout the study.

A three-round Delphi research method was chosen to allow for group interaction and consensus building without face-to-face meetings from the geographically dispersed body. The combination of numeric data and open-ended answer opportunities resulted in varying degrees of consensus on what are the most relevant external environmental constituencies of urban ATCs.

The first-round mailing consisted of an introductory letter explaining the purpose and an overview of the Delphi process, the Round I questionnaire, an ATC Constituencies figure, and an Informed Consent Form. Each reply by the panel of experts from the questions posed in the first questionnaire was compiled. The 14 external environmental constituencies identified were sent to each panelist as the second-round questionnaire. Expert panel members were instructed to rate each external environmental constituency according to their perceived relevance on a five-point Likert style scale.

The group perceptions from the second-round, along with their individual responses, were offered on the third questionnaire. The respondents then were asked to review their ratings on the same Likert style scale with consideration given to the group responses. Expert panelists were provided space on the form and encouraged to explain any final ratings that differed significantly from those of the group.

The data from these questionnaires provided a list of external environmental constituencies as well as a hierarchical ranking of the relevance of these elements for

urban ATCs. Whether consensus was achieved among the panel of experts concerning the relevance of each item was also derived from the examination of the data.

To answer research question 3, external management strategies were identified that facility administrators of urban advanced technology centers should use to either adapt to or alter their relevant external environmental by constituencies (Gordon, et al., 1999; Hoy & Miskel, 1996; University of Missouri, 2000). These external management strategies may be categorized as either internal or interorganizational. Internal management strategies that urban ATCs facility administrators should use are planning and forecasting, boundary spanning, and adjusting internal operations. Interorganizational management strategies that should be used to modify the impact that external environmental constituencies have on urban ATCs are establishing favorable linkages and altering the external environment (Gordon, et al., 1999).

Conclusions

This study was designed to provide a communication process that would clarify the exchanges that urban advanced technology centers have with the external environment. There were three research questions addressed by this study. The research questions and their findings follow. Additionally, based upon the panelists' perceptions, inferences pertaining to urban advanced technology centers and external environmental uncertainty are postulated.

Research Question 1: What external environmental constituencies of urban advanced technology centers are relevant to goal setting, goal achievement, effectiveness, and survival? The panelists identified 14 relevant external environmental constituencies

of urban ATCs. Listed below in alphabetical order are the 14 external environmental constituencies. Beside each external environmental constituency is the designation of each as either a task or general environmental element. Task environmental constituencies are those external organizations and conditions that are directly related to a school's main operation. The general external environmental constituencies are those outside institutions and conditions having infrequent or long-term impacts on a school's operation (Harrison, 1994; Hoy & Miskel, 1996).

- Accrediting Agencies - task environmental constituency.
- Area Business - task environmental constituency.
- Area Politicians - task environmental constituency.
- ATC Cultural Values - general environmental constituency.
- Cultural Values - general environmental constituency.
- Current Workers - task environmental constituency.
- Demographics - general environmental constituency.
- Economic Development Organizations - task environmental constituency.
- Economic/Market Forces - general environmental constituency.
- Information Technologies (IT) - general environmental constituency.
- Legislatures - Political/legal - task environmental constituency.
- Other Educational Organizations - Public/private - task environmental constituency.
- Parent College or Organization - task environmental constituency.
- Taxpayers - task or general environmental constituency.

The 14 external environmental constituencies listed delineate a broad array of outside influences. The mixture of task and general external environmental constituencies demonstrated the recognition by the expert panel of the importance of organizations and conditions locally, nationally, and internationally.

Research Question 2: Of the identified external environmental constituencies, which are considered the most relevant? Two criteria were utilized in analyzing this data, priority and consensus. The 14 external environmental constituencies are presented below in ascending order of group median rating. Whether the panel of experts achieved consensus is also stated. Commentary by the panel of experts, as written or paraphrased, provides insight into the standing accorded each item is included.

- **Taxpayers** - This factor was one of two identified relevant external environmental constituencies rated by the panel as having limited relevance to goal setting, goal achievement, effectiveness, and survival for ATCs (Group Median Rating of 2). Consensus was not reached among the expert panelists as to the importance of this relevant external environmental constituency. One panelist noted on the Round III questionnaire, "As a group, I see very little interest expressed by taxpayer groups."
- **Accrediting Agencies** - These governmental departments were rated as limited in regards to the relevance for urban ATCs (Group Median Rating of 2). Consensus was reached among the panel of experts as to the importance of this external environmental constituency.
- **Other Educational Organizations** - The expert panel achieved consensus in determining that the magnitude of relevance these external environmental

constituencies have on urban ATCs is moderate (Group Median Rating of 3).

Remarks made by the expert panelists about this external environmental constituency focused on them as competition. The only comment that one panelist made about other educational organizations was, “Many competitors – both public and private.” It was noted by another panelist that how important this issue was to an ATC was determined by the ATC’s service region.

- **Cultural Values** - The expert panel rated this item as moderate in relevance (Group Median Rating of 3). Consensus was reached among the panelists as to the importance of this external environmental constituency. In light of the fact this item was perceived as somewhat relevant by the expert panel as a whole, one facility administrator stated that urban ATCs work primarily with business clients and typically do not debate liberal vs. technical education.
- **Area Politicians** - The influence that this group of people exerts on urban ATCs was rated as having moderate relevance (Group Median Rating of 3). Consensus was reached among the panel of experts as to the importance of this external environmental constituency.
- **Legislatures - Political/legal** - This external environmental constituency was rated as having moderate relevance to urban ATCs (Group Median Rating of 3). Consensus was not reached among the expert panelists as to the importance of this external environmental constituency. As with the spread of opinions regarding degree of relevance for other elements in this list, the differences may be attributed to location. Many centers are funded by revenue generated through

course offerings, some are strictly state funded, while others receive financial support from both state and local sources.

- **Demographics** - Significant relevance was the rating given by the panel of experts for this item (Group Median Rating of 4). Consensus was reached among the expert panelists as to the importance of this external environmental constituency. Expert panelists noted that a direct consequence of growth in minority and international populations in an urban ATC service area requires the provision of additional services such as offering English as a second language course.
- **Parent College or Organization** - The panel of experts rated this external environmental constituency as having significant relevance to ATCs (Group Median Rating of 4). Consensus was not reached among the expert panelists as to the importance of this external environmental constituency. Conflict, competition, and provincial views may be used to summarize the comments made by panelists concerning this constituency. It was stated by one panelist that, “Nearly all ATCs that I am familiar with have internal competition and some level of conflict with the continuing education department.” The same panelist mentioned that most of the staff was too busy to be concerned about the ATC. On a more positive note, one panel member stated that after years of strained relations with the parent college, more positive attitudes currently prevail.
- **Economic Development Organizations** - This external environmental constituency was rated as having significant relevance (Group Median Rating of 4). Consensus was reached among the panel of experts as to the importance of this external environmental constituency. According to the expert panelists, the impact of

economic development organizations on urban ATCs is twofold. Urban ATCs may be viewed as one of the most important forces attracting new businesses to a region. Therefore, economic development organizations in concert with urban ATCs develop and implement far-reaching marketing strategies. In turn, the industries that are attracted to a region by an economic development organization drive the programmatic offerings of urban ATCs.

- **Current Workers** - This population was rated as significant to urban ATCs (Group Median Rating of 4). Consensus was reached among the expert panelists as to the importance of this external environmental constituency. The four highest rated external environmental constituencies, those that were perceived to be significant or most significant, were not commented on by the expert panelists in the final round.
- **Information Technologies (IT)** - The rating for this facet of industry was significant (Group Median Rating of 4). Consensus was reached among the panel of experts as to the importance of this external environmental constituency. Advanced technology centers are designed primarily as schools that provide instruction and training for students in the latest engineering sciences, manufacturing and industrial technologies, information technologies, and telecommunications (Tidewater Community College, 1999). As such, expert panelist believed that urban ATCs must maintain state-of-the-art programs and scrutinize the developments of the information technology industry.
- **Economic/Market Forces** - The rating for this external environmental constituency was significant (Group Median Rating of 4). Consensus was reached among the

panel of experts as to the importance of this constituency. The expert panel concurred that the ebb and flow of economic/market forces affect employer's training requests, which determine programmatic offerings of urban ATCs.

- **ATC Cultural Values** - This affective element was one of two external environmental constituencies that were rated as the most relevant (Group Median Rating of 5). Consensus was reached among the panel of experts as to the importance of this external environmental constituency. Expert panelists noted that this external environmental constituency mandates that urban ATCs provide focused customer service that is delivered effectively and efficiently. To deliver such service requires continuous, comprehensive programmatic and administrative planning, implementation, and evaluation.
- **Area Business** - Each expert panelist responding to the Rounds II and III questionnaires rated this external environmental constituency as the most relevant to goal setting, goal achievement, effectiveness, and survival (Group Median Rating of 5). Consensus was reached among the panel of experts as to the importance of this external environmental constituency. The expert panel believed that the training needs of local businesses should be the primary focus of urban ATCs. To maintain this focus, expert panelists agreed that urban ATCs should develop all their goals with area businesses in mind.

Research Question 3: How should facility administrators of urban advanced technology centers respond to the identified relevant external environmental constituencies? Strategies that should be used by facility administrators of urban

advanced technology centers in response to the 14 identified external environmental constituencies are cited below.

Research-based internal and interorganizational external management strategies have been identified that facility administrators of urban advanced technology centers should use to either adapt to or alter their external environmental constituencies (Gordon, et al., 1999; Hoy & Miskel, 1996; University of Missouri, 2000). According to Gordon and colleagues (1999) internal management strategies that urban ATCs facility administrators should use are planning and forecasting, boundary spanning, and adjusting internal operations. Planning and forecasting strategies are used to predict changes in the external environmental. Boundary spanning strategies serve two functions. The first function is detecting information about changes in external environmental constituencies. The second function is to represent the school to external environmental constituencies positively. The strategy of adjusting internal operations take place when schools are internally structured to be compatible with the kind, clarity, and amount of information those facility administrators receive, the availability of resources, and the mandates from society.

Interorganizational management strategies that should be used to modify the impact that external environmental constituencies have on urban ATCs are establishing favorable linkages and altering the external environment. The aim of establishing favorable linkages with schools' external environmental constituencies is to increase organizational power, reduce external environmental uncertainty, and increase performance by ensuring a constant flow of needed information and resources. Two techniques for establishing favorable linkages are forming partnerships and cooptation

(Hoy & Miskel, 1996). Altering the external environment involves two methods that can be used to modify the impact that external environmental constituencies have on urban ATCs (Gordon, et al., 1999). One method is political activity and the other is the pooling of resources in educational associations (Gordon, et al., 1999; Hoy & Miskel, 1996; University of Missouri, 2000).

Listed below are the 14 external environmental constituencies that were identified as relevant by the ATC panel of experts. Adjacent to this listing are external management strategies that should be used in response to the 14 relevant external environmental constituencies. The selection of these strategies was based upon comments made by the expert panelists as to whether the external environmental constituencies should be perceived from an information, resource dependence, or institutional perspective. The information perspective assumes that external environmental constituencies are sources of information to be used by organizational administrators. The resource dependence viewpoint presupposes that organizations cannot generate internally all the needed resources and that resources must come from external environmental constituencies. The institutional perspective assumes that some external environmental constituencies encourage ATCs to conform to the norms, values, and ideologies institutionalized in society (Hoy & Miskel, 1996).

Taxpayers

As the following expert panelists' statements revealed, the external environmental constituency taxpayer was perceived to be an information perspective issue:

"The taxpayers of our community generally see the value in what we do."

“In our case, the local citizens have very high expectations regarding workforce development and the positive impact our ATC can have on economic development. If these expectations are not met within a few years, I suppose that taxpayer groups may become a significant external environmental constituency.”

In this information perspective context, urban ATC facility administrators should respond to the external environmental constituency taxpayer with boundary spanning activities that positively represents urban ATCs. In promoting a positive image of the school, external environmental uncertainty and dependence on various external environmental constituencies like taxpayers is reduced (Hoy & Miskel, 1996). In the report, *Major Needs of Career and Technical Education in the Year 2000: Views from the Field* (Lewis, 2001), marketing a new image of today’s Career and Technical Education (CTE) courses is recommended. The purpose of marketing a new image is to change the perception that CTE offers an inferior curriculum, appropriate only for those students who cannot meet the demands of a college preparatory program. Based upon “new image” dissemination activities recommended in this report, urban ATC facility administrators should conduct or support the following activities:

- **Publicize information on how CTE courses offered at ATCs are different than the courses that most adults remember from their high school years.**
- **Identify and publicize success stories, such as profiles of ATC graduates in well-paying careers where they use the skills they studied.**
- **Identify and disseminate credible information that demonstrates ATCs contributions to learning and earning.**

- **Identify three or four clearly stated themes that adequately describe ATCs. Market the same message at national, state, and local levels.**

Accrediting Agencies

The panel of experts made no statements during the three iterations regarding this external environmental constituency. However, accrediting agencies serve the governmental function of setting and regulating rules and requirements for urban ATCs (Hoy & Miskel, 1996). As such, urban ATC facility administrators should employ the following strategies, adjusting internal operations, political activities, and the pooling of resources in educational associations. In order to receive continued support and maintain the cultural endorsement from accrediting agencies, facility administrators of urban ATCs should employ the strategy of adjusting internal operations to fit the current mandates (Gordon, et al., 1999).

To erect barriers against future unwanted influences or establish rules favorable to urban ATCs, individual political lobbying and the related strategy of pooling of resources in educational associations to lobby members of state and federal legislators should be assumed by facility administrators in response to accrediting agencies (Hoy & Miskel, 1996). Facility administrators of urban ATCs should be active members of educational associations and foster other career and technical education lobbying organizations so they may exert power in guiding the actions of accrediting agencies.

Other Educational Organizations

As the following expert panelists' statements revealed the external environmental constituency other educational organizations was perceived from both an information and a resource perspective:

“Provide information about the educational level and workforce skills of incoming students. Your ATC students must also know that the educational programs at the ATC can lead to further educational opportunities at colleges and universities.”

“It is important to know what the competition is offering. ATCs are trying to attract the same students.”

“Some other educational organizations can be direct competitors.”

“Competitive information is essential to strategic planning.”

“There are many competitors – both public and private.”

From an information perspective, urban ATC facility administrators should respond to the external environmental constituency, other educational organizations, with boundary spanning information detection activities. Boundary spanning information detection activities concentrate on the transfer of information between external environmental constituencies and the school (Hoy & Miskel, 1996). In performing these information detection activities, facility administrators would be able to assess information about incoming students and be able to ascertain information program graduates may need in the future. Others in the school organization that may perform boundary spanning detection roles are administrators in public information, government relations, and research and development departments (Hoy & Miskel, 1996).

Perceived by the panel of experts to be a competitor for resources needed by urban ATCs, the external environmental constituency, other educational organizations, should be responded to by facility administrators with planning and forecasting and boundary spanning strategies. The object in using planning and forecasting strategies in the context of this external environmental constituency would be to anticipate the

potential trends of these competing organizations and then internally plan in accordance with the predicated trends. Often the parent college or organization of urban ATCs has established a separate planning department that analyzes potential actions and counteractions by other organizations upon which facility administrators may extract information (Hoy & Miskel, 1996).

The reason facility administrators of urban ATCs should respond to the external environmental constituency, other educational organizations, with boundary spanning strategies is two-fold. First, having collected information about changes in these perceived competitors, urban ATCs facility administrators can then make plans or adjust current programs accordingly. Second, by using information dissemination activities, facility administrators can attempt to influence in a positive way the opinion that potential students and employers have of urban ATC services (Hoy & Miskel, 1996).

Cultural Values

As the following expert panelists' statement revealed, the external environmental constituency, cultural values, was viewed as an issue of information exchange or specifically, a negative perception based on false or limited information:

"Impacting student recruitment is the perception that a liberal arts education is better than technical training."

In this information perspective context, urban ATC facility administrators should respond to the external environmental constituency, cultural values, with boundary spanning activities that positively represent ATCs. On the topic of representational boundary spanning activities, Hoy & Miskel (1996) stated, "The idea is to influence other people's perceptions of the organization" (p. 214).

Area Politicians

As the following expert panelist's statement revealed, the external environmental constituency, area politicians, was perceived to be an element concerning both information and resource perspectives regarding urban ATCs:

"Area Politicians must understand the importance of the ATC so they can help direct funding that will help your cause."

Viewed from both information and a resource perspective, urban ATC facility administrators should respond to the external environmental constituency, area politicians, with a combination of internal and interorganizational strategies. To assist area politicians with understanding the importance of urban ATCs, the boundary spanning strategy of influencing their perception should be undertaken by facility administrators.

Regarding the resource perspective of influencing funding for urban ATCs, individual political lobbying and the pooling of resources in educational associations to lobby area politicians should be supported by facility administrators (Hoy & Miskel, 1996). In the context of the pooling of resources in educational associations, facility administrators of urban ATCs should actively support The National Coalition of Advanced Technology Centers (NCATC) and other career and technical education lobbying organizations.

Legislatures - Political/legal

As the following expert panelists' statements revealed, the external environmental constituency, legislatures - political/legal, was perceived to be an element concerning both information and resource perspectives regarding urban ATCs:

“Extremely relevant in STATE – legislative support is critical to growth of the ATC.”

“Technology changes so fast that maintaining current programs, both from a human resources and an equipment standpoint, is difficult without sufficient funding from the state legislature.”

“While it is not the case in my state, the funding for technical education impacts the quality of programs that ATCs may offer.”

“An important external constituency is state legislatures because they determine the level of funding for our programs.”

“The legislatures in STATE allocate the funding for Technology Education separately from Common Education (K through 12) and Higher Education. This requires a great deal of accountability to ensure our lawmakers understand our accomplishments and our challenges.”

Perceived from both information and a resource perspective, urban ATC facility administrators should respond to the external environmental constituency, legislatures - political/legal, with a combination of strategies. To assist legislatures with understanding the importance of urban ATCs, the boundary-spanning strategy of influencing their perception should be undertaken by facility administrators.

Regarding the resource perspective of obtaining funding for urban ATCs, facility administrators should support the pooling of resources in educational associations. In supporting the pooling of resources in educational associations, the cost of paying for activities such as lobbying legislatures, influencing new legislation, and presenting public relations campaigns can be afforded (Hoy & Miskel, 1996). In the context of the

pooling of resources in educational associations, facility administrators of urban ATCs should actively support The National Coalition of Advanced Technology Centers (NCATC) and other career and technical education lobbying organizations.

Demographics

As the following panel of experts' statements revealed the external environmental constituency, demographics, was perceived to be an element concerning the information perspective:

"It is important to keep a close watch on the changing demographics. Indications are that this may become more important next year."

"While external agencies, governments, and others will have an impact on initial funding and design, the local economy and industry needs, the condition of the local workforce (demographics) and the parent college/organization itself will have the greatest impact on how functional the ATC will be ultimately."

"This includes a very significant growth in minority populations – especially those with weak English-speaking skills."

Viewed from an information perspective of needing data regarding the external environmental constituency, demographics, facility administrators of urban ATCs should respond with planning and forecasting strategies. Planning and forecasting strategies would allow facility administrators of urban ATCs to anticipate changes in the characteristics of their students and take programmatic actions accordingly (Gordon, et al., 1999). Often the parent college or organization of urban ATCs has established a separate planning department that analyzes potential actions and counteractions by other

organizations upon which facility administrators may obtain information (Hoy & Miskel, 1996).

Parent College or Organization

As the following panel of experts' statements revealed, the external environmental constituency, parent college or organization, was perceived to be a component pertaining to the information perspective:

"How the parent college or organization views the ATC and how the ATC is incorporated within the whole college mission is critical. So that the ATC is not seen as a competing element to the standard/traditional education services, how the parent goes about planning and developing phase of the ATC is critical to its future acceptance and success."

"The organization of many of our community colleges has the ATC outside the 'normal' academic unit. For example, it is not part of the Division of Arts and Sciences or Division of Business and Technology. It is therefore, its own separate unit, and often it is considered a 'profit-center.' That designation sets up an external constituency known as, 'the rest of the college.' It is a double-edged sword. Parts of the college look at the ATC as competition; parts of the college look at the ATC as collaborators; still others have no idea why it exists. All of these responses are reflected in the goal setting and goal achievement of the ATC (in colleges where this type of venue exists). While the ATC may be outside the academic units, it is nonetheless part of the management system of the entire institution. Strategic planning, budget development, goal setting, and vision development are all accomplished with 'academicians' who may or may not have any idea what the ATC does or accomplishes. Therefore, this may be the most critical

constituency to the ATCs survival. This constituency needs the most communication; this constituency needs the most relationship building; this constituency needs the most knowledge about what the ATC is doing. It may be difficult for 'our own college' to measure our success effectively without truly understanding what we do; yet it is critical that understanding occur."

"While external agencies, governments, and others will have an impact on initial funding and design, the local economy and industry needs, the condition of the local workforce (demographics) and the parent college/organization itself will have the greatest impact on how functional the ATC will be ultimately."

"Nearly all ATCs that I am familiar with have internal competition and some level of conflict with the continuing education department. The more 'academic' groups of the college have little or no knowledge of what ATCs do nor understand its reason for existing."

Viewed by facility administrators of urban ATCs as an issue of information exchange, boundary spanning and cooptation strategies should be employed in response to the external environmental constituency, parent college or organization. By using boundary spanning information detection strategies facility administrators of urban ATCs can scan and monitor events pertaining to their parent college or organization and use that data to make plans or adjust programs accordingly. Others in the school organization that may perform boundary spanning detection roles are administrators in public information, government relations, and research and development departments. To ensure that members of the parent college or organization perceive the role of the ATC within the

total organization in a positive light, representational boundary spanning activities should be used (Hoy & Miskel, 1996).

Urban ATC administrators should also utilize the strategy of cooptation or gaining support from important interest groups or individuals by bringing them into the policy structure of the school organization. A common cooptation strategy is to appoint members of influential external environmental constituencies to advisory committees (Gordon, et al., 1999; Hoy & Miskel, 1996).

Economic Development Organizations

As the following expert panelist's statement revealed, the external environmental constituency, economic development organizations, was perceived to be an element concerning the information perspective:

"These organizations can provide the ATC with valuable information about new business opportunities and the programs ATCs need to concentrate on."

Perceived from the information perspective, urban ATC facility administrators should respond to the external environmental constituency, economic development organizations, with boundary spanning information detection strategies. Boundary spanning detection activities concentrate on the transfer of information between external environmental constituencies and the school (Hoy & Miskel, 1996). In performing these information detection activities, facility administrators of urban ATCs would be able to assess information about new businesses entering their service region and in turn adjust or create programs to meet these potential customers training needs. Others in the school organization that may perform boundary spanning detection roles are administrators in

public information, government relations, and research and development departments (Hoy & Miskel, 1996).

Current Workers

As the following expert panelist's statement revealed, the external environmental constituency, current workers, was perceived to be an element concerning the information perspective:

"Identifying the training needs of current employees is an area that internally is of great concern to building administrators."

Viewed from an information perspective, urban ATC facility administrators should respond to the external environmental constituency, current workers, with boundary spanning information detection activities. Boundary spanning detection activities concentrate on the transfer of information between external environmental constituencies and the school (Hoy & Miskel, 1996). Having collected information about the training needs of current workers, urban ATCs facility administrators can then adjust current course offerings accordingly. Others in the school organization that may perform boundary spanning detection roles are administrators in public information, government relations, and research and development departments (Hoy & Miskel, 1996).

Information Technologies (IT)

As the following expert panelists' statements revealed, the external environmental constituency, information technologies, was perceived to be an element concerning both information and resource perspectives regarding urban ATCs:

"ATCs must maintain state-of-the-art programs and as such must scrutinize the developments of the information technology industry."

“Technology changes so fast that maintaining current programs, both from a human resources and an equipment standpoint, is difficult without sufficient funding from the state legislature.”

“So much of what our ATCs do involves computers and IT. It is a must for our goals because of the cost involved. We cannot ignore either the cost effectiveness of ‘better’ IT, nor the ease with which IT allow us to plan and solve issues. Many of our customers have IT needs that we can fill. IT, therefore, becomes a part of everything we do. Without strong IT, we may not survive. Our competition will beat us to our own customers. This constituency, therefore, becomes critical to our success.”

Perceived from both information and resource perspectives, urban ATC facility administrators should respond to the external environmental constituency, information technologies, with a combination of strategies. These strategies should include planning and forecasting, boundary spanning, political activity, and the pooling of resources in educational associations. The object in using planning and forecasting strategies in the context of this external environmental constituency would be to anticipate potential trends in the IT industry and then internally make both programmatic and procurement plans in accordance with the predicated trends. Often the parent college or organization of urban ATCs has established a separate planning department that analyzes potential actions and counteractions by other organizations upon which facility administrators may extract information (Hoy & Miskel, 1996).

Facility administrators of urban ATCs should respond to the external environmental constituency, IT, with boundary spanning detection strategies. Having

identified new technological developments, urban ATCs facility administrators can then make plans or adjust current programs and corresponding IT purchases accordingly.

Facility administrators, in order to pay for IT equipment and technical support services, should advocate individual political lobbying and the pooling of resources in educational associations (Hoy & Miskel, 1996). Facility administrators of urban ATCs should be active members of educational associations and foster other career and technical education lobbying organizations in order to sway area politicians, state legislatures, or their parent college or organization to fund these resources.

Economic/Market Forces

As the following expert panelists' statements revealed, the external environmental constituency, economic/market forces, was perceived to be an element concerning the information perspective:

"The ebb and flow of employers' training requests are a by-product of business trends. In times of heightened economic activity, the internal impact of meeting the training needs of employers can be quite intense."

"While external agencies, governments, and others will have impact on initial funding and design, the local economy and industry needs, the condition of the local workforce (demographics) and the parent college/organization itself will have the greatest impact on how functional the ATC will be ultimately."

"Economic and market forces will drive the ebb and flow of need for ATC services."

"Until recently, corporations were desperate for trained employees. Demand for training was very high although the irony was production schedules were so tight

employers could not let employees leave the line for training. Now many area companies are experiencing slow downs and layoffs. They still need training but have fewer people and are cutting training budgets. In general, market forces are the key factor in overall strength of our ATC business.”

Perceived from an information perspective of needing predicted and current data regarding the external environmental constituency, economic/market forces, facility administrators of urban ATCs should respond with planning and forecasting strategies and boundary spanning detection strategies. Planning and forecasting strategies would allow facility administrators of urban ATCs to anticipate either the increased or decreased need for training and make personnel, budgeting, and programmatic actions accordingly (Gordon, et al., 1999). Often the parent college or organization of urban ATCs has established a separate planning department that analyzes potential actions and counteractions by other organizations from which facility administrators may gain information (Hoy & Miskel, 1996).

In responding to economic/market forces with boundary spanning detection strategies, facility administrators of urban ATCs can ascertain the current and projected changes in this external environmental constituency and then adjust current programs accordingly. Others in the school organization that may perform boundary spanning detection roles are administrators in public information, government relations, and research and development departments (Hoy & Miskel, 1996).

ATC Cultural Values

As the following expert panelists' statements revealed, the external environmental constituency, ATC cultural values, was perceived to be an element concerning the institutional perspective:

"I think the emphasis on customers is very important and appropriate, high quality programs at reasonable prices is key."

"The commitment to be customer focused."

"The commitment to be responsive to business needs and to respond quickly."

"The commitment to providing business training and assistance better, faster, and cheaper."

Viewed from the institutional perspective, urban ATC facility administrators should respond to the external environmental constituency, ATC cultural values, by adjusting internal operations. According to Hoy & Miskel (1996) the most effective external environmental management strategy is for schools to internally conform to their relevant external environmental constituencies. Therefore, urban ATCs facility administrators must make conscious efforts at creating and maintaining quality, customer focused, affordable course offerings in order to receive the cultural endorsement from the social group comprised of other ATCs (Bealings, et al., 1996).

Area Business

As the following expert panelists' statements revealed, the external environmental constituency, area business, was perceived to be an element concerning an information and a resource perspective:

"We want to strongly support and encourage businesses to locate in STATE."

“As employers they are really the ‘customers’ of your product (students).

“Good ATC planning will include a strong degree of input from the local business and industry representatives. As the local businesses will be the main users of the ATC goods and services, their early buy-in is better guaranteed by their early and sustained involvement.”

“In STATE funding for us is far more determined by our clients than by the state or local government. We do use state grants when we can, but ATC revenues fund most staff and equipment needs.”

“While many of our ATCs exist for academic instruction, many more of them exist because we can respond to the in-service training needed by area businesses, and we can respond to the changing needs of the market and job force with specialized programs. Area businesses need that type of specific training and ATCs respond to those needs. Therefore, we must set our goals with area businesses in mind. Without the evaluation from these businesses (our customers), and without feedback and constant communication, we would not know how to survive.”

“There must be sizeable business to support an ATC.”

“Business must be engaged and responded to.”

“Meeting the training needs of the local businesses is ATCs primary focus.”

“When business and industry do not value educational partnerships, the information exchange and internal financial support suffer.”

To respond to the external environmental constituency, area business, facility administrators should employ an assortment of strategies. These strategies should include planning and forecasting, boundary spanning, adjusting internal operations, and

establishing favorable linkages. Planning and forecasting strategies would allow facility administrators of urban ATCs to anticipate changes in the training needs of area businesses and take programmatic actions accordingly (Gordon, et al., 1999). Often the parent college or organization of urban ATCs has established a separate planning department that analyzes potential actions and counteractions by other organizations upon which facility administrators may extract information (Hoy & Miskel, 1996).

In responding to area businesses with boundary spanning detection strategies, facility administrators of urban ATCs can ascertain the current and projected changes in this external constituency and then adjust current programs. Others in the school organization that may perform boundary spanning detection roles are administrators in public information, government relations, and research and development departments (Hoy & Miskel, 1996).

In order to meet the training needs and hence receive the fiscal support from the external environmental constituency, area businesses, facility administrators of urban ATCs should employ the strategy of adjusting internal operations to fit their current needs (Gordon, et al., 1999). According to Hoy & Miskel (1996) the most effective external environmental management strategy is for schools to internally conform to their relevant external environmental constituencies. Therefore, urban ATCs facility administrators should respond to the training needs of area businesses with programs tailored to satisfy these external environmental constituencies.

Facility administrators of urban ATCs should use both techniques for establishing favorable linkages with area businesses, forming partnerships and cooptation (Hoy & Miskel, 1996). When applicable, to ensure the desired scope and sequence of

new courses desired by area businesses, facility administrators of urban ATCs should form partnerships to develop curriculum (Lankard, 1995). Partnerships with employers are the key to ensuring that programs are aligned with the needs of the workforce (Lewis, 2001). Hoy & Miskel (1996) contend that the number of partnerships may be the best predictor of organizational influence on external environmental constituencies.

Urban ATC facility administrators also should utilize the strategy of cooptation. A common cooptation strategy is to appoint members of influential external environmental constituencies to advisory committees (Gordon, et al., 1999; Hoy & Miskel, 1996). By bringing individuals from area businesses into the policy structure of urban ATCs, facility administrators will receive the feedback useful in program planning and implementation.

In summary, as shown in Table 4, internal management strategies should be utilized for each of the panelists 14 identified external environmental constituencies. Applicable for responding to 11 of the external environmental constituencies, boundary spanning was the most frequently suggested internal management strategy. Interorganizational management strategies should be used to alter five of the identified external environmental constituencies. Establishing favorable linkages was suggested for use in responding to three of the external environmental constituencies while altering the external environment should be used for responding to the other two.

Table 4
Summary of Findings and Suggestions

Constituency	Classification	Group Median	Relevancy	IQR	Consensus	Internal Strategies	Interorganizational Strategies
Area Business	Task	5	Most Relevant	0.0	Yes	Planning and Forecasting, Boundary Spanning, Adjusting Internal Operations	Establishing Favorable Linkages
ATC Cultural Values	General	5	Most Relevant	0.5	Yes	Adjusting Internal Operations	N/A
Economic Development Organizations	Task	4	Significant	0.5	Yes	Boundary Spanning	N/A
Economic/Market Forces	General	4	Significant	1.0	Yes	Planning and Forecasting, Boundary Spanning	N/A
Information Technologies (IT)	General	4	Significant	1.0	Yes	Planning and Forecasting, Boundary Spanning	Establishing Favorable Linkages
Current Workers	Task	4	Significant	1.0	Yes	Boundary Spanning	N/A
Parent College or Organization	Task	4	Significant	1.5	No	Boundary Spanning	Establishing Favorable Linkages
Demographics	General	4	Significant	1.0	Yes	Planning and Forecasting	N/A
Legislatures: Political/Legal	General	3	Moderate	2.0	No	Boundary Spanning	Altering the External Environment
Area Politicians	Task	3	Moderate	1.0	Yes	Boundary Spanning	Altering the External Environment
Cultural Values	General	3	Moderate	1.0	Yes	Boundary Spanning	N/A
Other Educational Organizations	Task	3	Moderate	0.5	Yes	Boundary Spanning	N/A
Accrediting Agencies	Task	2	Limited	0.5	Yes	Adjusting Internal Operations	N/A
Taxpayers	Task	2	Limited	1.5	No	Boundary Spanning	N/A

Recommendations

The following recommendations for further research and action by facility administrators of urban advanced technology centers that follows are based upon the findings of this study:

1. Considering that the relevant external environmental constituencies may vary from one center to another, it is recommended that facility administrators examine their individual service areas to determine their unique relevant external environmental constituencies. Hoy and Miskel (1996) report that facility administrators tend to focus monitoring and planning processes on local external environmental constituencies and often fail to recognize environmental factors in the larger society. Therefore, as facility administrators examine their individual service areas to determine their unique relevant external environmental constituencies, they should be vigilant to include both local and immediate as well as more distant and long-term external environmental constituencies.
2. When considering how to adapt to or alter their external environmental constituencies, it is recommended that urban ATCs facility administrators employ a decentralized internal organizational structure in order to maintain or increase the effectiveness of the overall school operation. This would require urban ATCs facility administrators to empower their staff and instructors, as subject area expects to monitor, plan, develop, and maintain all aspects of their subject area.
3. To ensure up-to-date data regarding their relevant external environmental constituencies, it is recommended that facility administrators of urban ATCs frequently assess the external environment. It is suggested that this frequent assessment employ both planning and forecasting and boundary spanning detection strategies. According to

Hoy & Miskel (1996) “planning and forecasting strategies anticipate environmental changes and take actions to soften their adverse effects (p. 214).” When using planning and forecasting strategies, the object is to identify external environmental constituencies and analyze potential trends of these organizations that are relevant to schools. Having forecasted various likely scenarios, schools can then plan in accordance with their predictions (Hoy & Miskel, 1996). Boundary spanning, the process of reaching out beyond the school and attempting to link with selected external environmental constituencies, provides data that enables urban ATCs to develop new programs or adjust current programs (Gordon, et al., 1999; Hoy & Miskel, 1996; University of Missouri, 2000).

4. It is recommended that research be conducted on the multiple tenant structure of the Virginia Beach ATC to assess the effectiveness and efficiency of this secondary school/community college organizational model. This study exposed that a byproduct of the external environmental constituency, parent college or organization, could be conflict, internal competition, and the disregard by other college staff members for the ATC. Research on the multiple tenant structure of the Virginia Beach ATC would reveal if that were the case at this center.

5. It is recommended that representatives of Tidewater Community College, Virginia Beach City Public Schools, and the Virginia Beach City Economic Development Department that will administer programs housed in the Virginia Beach ATC review the findings of this study, most notably the information regarding the external environmental constituency parent college. The purpose of this review will be to avoid hostilities that other urban ATC partners have experienced. An antagonistic relationship between these

partners would have negative ramifications for instruction, at both levels, and hamper economic development efforts in the region.

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APPENDIX A
DELPHI PANEL NOMINATION REQUEST

Date

Name

Title

Agency Name

Address

City, State, Zip Code

Dear _____:

To define the external environment of advanced technology centers (ATCs) requires that a panel of experts be assembled. The selection of panel members is crucial to receiving information that will be beneficial to ATCs nationwide. After panel members have been selected and have agreed to participate, they will be sent three surveys. The second and third surveys will include group response information. Each survey will take approximately 15 minutes to complete. Basic demographic information will also be asked of each panel member. All responses will be kept confidential.

I have been a career and technical educator for the past fourteen years, and I'm conducting this Delphi study as a doctoral candidate at Old Dominion University. My interest in ATC's is more than just academic and certainly not arbitrary. Virginia Beach

City Public Schools, my employer, and Tidewater Community College are currently building an ATC due to open in 2002.

As a member of the President's Advisory Council of the National Coalition of Advanced Technology Centers, I'm requesting your help to identify prospective members of a Delphi (3 rounds) panel. The panelist(s) you nominate will help identify the external forces, i.e., area business, regulatory agencies, economic forces, etc. that most affect the internal decisions of ATCs.

Prospective panelist should be a building administrator within an operating ATC located in an urban environment. Should you meet the criteria, you are welcomed and encouraged to recommend yourself. Please send name(s), title(s), and the ATC prospective panelist(s) are affiliated with, of three or more persons to me by April 30, 2001. I have enclosed a self-addressed, stamped envelope or you may contact me electronically. My work telephone is (757) 473-5671; my home telephone number is (757) 480-2057, and my e-mail address is dansmith@vbcps.k12.va.us

Please contact me should you have questions. Thank you.

Sincerely,

Daniel R. Smith

APPENDIX B
NCATC MEMBER INSTITUTIONS

NCATC Member Institutions 2000 - 2001

Alabama Technology Network, Center for Electronics	Eufala	AL
Albuquerque Technical Vocational Institute	Albuquerque	NM
Arkansas State University-Beebe	Beebe	AR
Augusta Technical Institute	Augusta	GA
Austin Community College	Austin	TX
Bill J. Priest Institute for Economic Development	Dallas	TX
Black Hawk College	East Moline	IL
Boise State University	Boise	ID
Brevard Community College	Cocoa	FL
Bristol Community College	Fall River	MA
Burlington County College	Mt. Laurel	NJ
Butler County Community College	El Dorado	KS
Central Carolina Technical College	Sumter	SC
Central Lakes College	Brainerd	MN
Central Maine Technical College	Auburn	ME
Central Piedmont Community College	Charlotte	NC
Cerritos Community College	Norwalk	CA
Chattanooga State Technical Community College	Chattanooga	TN
Chemeketa Community College	Salem	OR
Chesapeake College	Wye Mills	MD
City College of San Francisco	San Francisco	CA
Clackamas Community College	Wilsonville	OR
Clinton Community College with GATC	Davenport	IA

College of Lake County	Grayslake	IL
College of the Canyons	Santa Clarita	CA
Colorado Mountain College	Leadsville	CO
Columbus State Community College	Columbus	OH
Community College of Baltimore County	Baltimore	MD
Community College of Southern Nevada	Las Vegas	NV
County College of Morris	Randolph	NJ
Cuyahoga Community College	Cleveland	OH
Danville Community College	Danville	VA
Daytona Beach Community College	Daytona Beach	FL
De Anza College	Sunnyvale	CA
Dekalb Technical Institute	Covington	GA
East Mississippi Community College	Mayhew	MS
El Camino College	Torrance	CA
El Paso Community College	El Paso	TX
Florence-Darlington Technical College	Florence	SC
Francis Tuttle Vo-Tech Center	Oklahoma City	OK
Fresno City College	Clovis	CA
Front Range Community College	Westminister	CO
Gateway Technical College	Elkhorn	WI
Glendale Community College	Glendale	CA
Grand Rapids Community College	Grand Rapids	MI
Greater Baltimore C. C. Adv. Technology Center	Baltimore	MD
Gwinnett Technical Institute	Lawrenceville	GA

Hagerstown Community College	Hagerstown	MD
Haywood Community College	Waynesville	NC
Henry Ford Community College	Dearborn	MI
Honolulu Community College	Honolulu	HI
Hutchinson Community College	Hutchinson	KS
Indian Hills Community College	Ottumwa	IA
Irvine Valley College	Irvine	CA
Itawamba Community College	Fulton	MS
Ivy Tech State College	Terre Haute	IN
Jackson State Community College	Jackson	TN
Joliet Junior College	Joliet	IL
Kalamazoo Valley Community College	Kalamazoo	MI
Lehigh Carbon Community College	Schnecksville	PA
Linn-Benton Community College	Albany	OR
Linn State Technical College	Mexico	MO
Long Beach City College	Long Beach	CA
Lorain County Community College	Elyria	OH
Maryland Dept. of Business and Economic Dev	Baltimore	MD
Maryland Higher Education Commission	Annapolis	MD
Massachusetts Bay Community College	Wellesley Hills	MA
Massasoit Community College	Brockton	MA
McHenry County College	Crystal Lake	IL
Mesa State College	Grand Junction	CO
Metropolitan Community College	Kansas City	MO

Midlands Technical College	Columbia	SC
Moraine Valley Community College	Palos Hills	IL
Mott Community College	Flint	MI
Mount San Antonio	Walnut	CA
New Hampshire Community Technical College	Laconia	NH
North Orange County Community College District	Yorba Linda	CA
Northampton Community College	Bethlehem	PA
Northern Essex Community College	Haverhill	MA
Northwestern Michigan College	Traverse City	MI
Oklahoma City Community College	Oklahoma City	OK
Onondaga Community College	Syracuse	NY
Ouachita Technical College	Malvern	AR
Ozarks Technical Community College	Springfield	MO
Pearl River Community College	Hattiesburg	MS
Piedmont Technical College	Greenwood	SC
Pitt Community College	Greenville	NC
Portland Community College	Portland	OR
Pueblo Community College	Pueblo	CO
Reading Area Community College	Reading	PA
Richard J. Daley College	Chicago	IL
Riverside Community College	Norco	CA
Rock Valley College	Rockford	IL
Salt Lake Community College	Salt Lake City	UT
San Diego City College-CACT	San Diego	CA

Sierra Community College	Lincoln	CA
Sinclair Community College	Dayton	OH
South Carolina Manufacturing Extension Partnership	Columbia	SC
South Seattle Community College	Seattle	WA
South Suburban College	South Holland	IL
Southeast Community College	Milford	NE
Springfield Technical Community College	Springfield	MA
St. Clair College of Applied Arts and Technology	Windsor, Ontario	CAN
St. Louis Community College	St. Louis	MO
St. Philip's College- Southwest Campus	San Antonio	TX
Sussex County Community College	Newton	NJ
T. O. Murray & Associates	Seattle	WA
Tidewater Community College	Virginia Beach	VA
Technowork Strategies	Grand Rapids	MI
Texas State Technical College-Waco	Waco	TX
Trident Technical College	Charleston	SC
University College of the Cariboo	Kamloops, B.C.	CAN
University of Central Florida	Orlando	FL
University of Southern California	Los Angeles	CA
Utah Valley Community College	Orem	UT
Valencia Community College	Orlando	FL
Virginia Beach City Public Schools	Virginia Beach	VA
West Los Angeles College:CACT	Culver City	CA
West Virginia University	Parkersburg	WV

Western Nebraska Community College	Scottsbluff	NE
Workforce Directions	Knoxville,	TN
York County Technical College	Wells	ME
York Technical College	Rock Hill	SC

APPENDIX C

INTRODUCTORY LETTER SENT TO

NOMINATED ATC FACILITY ADMINISTRATORS

Date

Name

Title

Agency Name

Address

City, State, Zip Code

Dear _____:

I have been a career and technical educator for the past fourteen years, and I'm currently conducting a Delphi study as a doctoral candidate in Urban Education at Old Dominion University. The purpose of this study is to identify the external forces (business, regulatory agencies, economic forces, etc.) that most affect the internal decisions of advanced technology centers (ATC s) in order to give facility administrators like yourself a more expansive database for decision-making.

You were nominated by a member of the President's Advisory Council of the National Coalition of Advanced Technology Centers to be a participant in this important study. The criteria given for prospective panel members were that the person is a member of the National Coalition of Advanced Technology Centers and a building administrator within

an operating ATC located in an urban environment. You should be proud that you are considered to be one of a handful of experts in the area of ATC s.

A Delphi method will be used to collect the data needed to complete this study. This successive survey process will allow for group interaction without requiring face-to-face meetings. The surveys will be brief in nature, and all responses will be kept confidential.

The Delphi procedure is as follows: The first questionnaire included with this letter, requests that you answer two broad questions. The first question asks you to identify the external constituencies of urban ATC s that are relevant to goal setting, goal achievement, effectiveness, and survival. The second question asks that as a facility administrator of an urban advanced technology center what, if any, action does the identified external constituencies generate?

The second questionnaire will be sent out shortly after all initial responses have been received. The responses from the first round will be listed on the second questionnaire. You will be asked to rank the importance of each on a five-point scale. Also at this time you will be asked to provide some general demographic data.

The third, and final, round will report the extent to which there is consensus on the ratings. At this point you will be asked to review your initial ratings (provided with this mailing) in light of the group ratings. If your ratings remain outside the group consensus, you will be asked to provide a brief explanation.

I realize the demands on your time, and I appreciate your support of this study. The survey process has been made as concise as possible to minimize the time required for you to complete the survey. Please return the enclosed human subject release form and the first survey in the provided envelope by May 28, 2001. If you have any questions or concerns, please do not hesitate to contact me at work (757) 473-5671, home (757) 480-2057, or via e-mail at dansmith@vbcps.k12.va.us.

Thank you for your professionalism, time, and assistance.

Sincerely,

Daniel R. Smith

enclosures

APPENDIX D
DELPHI QUESTIONNAIRE I

DELPHI QUESTIONNAIRE I

Please identify the three to five external constituencies of advanced technology centers (ATC s) that are relevant to goal setting, goal achievement, effectiveness, and survival. A figure displaying possible ATC constituencies is provided. These constituencies cited on the graphic are not exhaustive. If there are constituencies not listed that you believe should be included, please list the constituency.

As a facility administrator of an urban advanced technology center what, if any, action does the identified external constituencies generate? Be as detailed as you wish. Please return by May 28, 2001. Thank you.

Should you prefer that future questionnaires be sent via e-mail, please provide your address below.

APPENDIX E

INFORMED CONSENT DOCUMENT

**Old Dominion University
Darden College of Education**

Urban Services – Urban Education

TITLE OF RESEARCH: Facility Administrator Perceptions of the External
Environments of Urban Advanced Technology Centers

INVESTIGATOR: Daniel R. Smith, Ph.D. candidate. Dr. John M. Ritz, dissertation
chair.

DESCRIPTION OF RESEARCH: Research has not defined the parameters of the
external environment and the subsequent responses of facility administrators of urban
advanced technology centers. Hence, the intent of this study was to develop a
communication process that will clarify the exchanges that urban advanced technology
centers have with the external environment.

EXCLUSIONARY CRITERIA: I am now or have been a facility administrator in an
operating urban advanced technology center.

BENEFITS: This information will add to the analysis of organizational behavior of
schools as open-systems. These findings will move from the theoretical to the practical
when this information is applied to the administration of an urban advanced technology
center under development in Virginia Beach, Virginia. In studying and applying research

to improve urban advanced technology centers the workforce preparation skills of urban youth and, their life chances, will be enhanced.

RISKS: Extreme measures will be undertaken to protect the confidentiality of all study participants. Records regarding participants will be destroyed at the conclusion of the research.

COSTS AND PAYMENTS: Participants efforts in this study are voluntary.

WITHDRAWAL PRIVILEGE: Participants may refuse to take part in this study or to withdraw at any time.

VOLUNTARY CONSENT: Participants will receive a copy of this informed consent form. A final copy of the research data will be provided upon request. This data will be in cumulative form and will not contain personal information.

Participant's Signature

Date

Investigator's Signature

Date

APPENDIX F

COVER LETTER AND

DELPHI QUESTIONNAIRE II

Date

Name

Title

Agency Name

Address

City, State, Zip Code

Dear _____:

Thank you again for participating in research on the external environments of advanced technology centers (ATCs). The results of the first round of the Delphi survey that you participated in have been compiled.

Round two, enclosed with this letter, entails reviewing the list of constituencies and corresponding internal responses developed by the panel. You are asked to rank the constituencies on a scale of one through five with one being the most irrelevant and five being the most relevant to goal setting, goal achievement, effectiveness, and survival of ATCs.

This time, after you return the completed questionnaire, the information from you and other facility administrators will be compiled to identify areas of consensus and dissent.

In the third and final Delphi questionnaire, this information will be sent back to you with instructions for further refinement and elaboration.

Additionally, at this time you are asked to provide some general demographic data.

Please return the completed questionnaire and demographic information by July 2, 2001.

Your prompt response is again appreciated.

If you have any questions or concerns, please do not hesitate to contact me at work (757) 473-5671, (757) 480-2057, or via e-mail at dansmith@vbcps.k12.va.us.

Sincerely,

Daniel R. Smith

DELPHI QUESTIONNAIRE II

Please rank the following external constituencies of advanced technology centers on a scale of one to five and return this survey by July 2, 2001.

- 1 Irrelevant to goal setting, goal achievement, effectiveness, and survival.
- 2 Limited relevance to goal setting, goal achievement, effectiveness, and survival.
- 3 Moderate relevance to goal setting, goal achievement, effectiveness, and survival.
- 4 Significant relevance to goal setting, goal achievement, effectiveness, and survival.
- 5 Most relevant to goal setting, goal achievement, effectiveness, and survival.

_____ **Accrediting Agencies**

Provide a framework of rules that ATCs must operate within. May be an impediment to adapting to rapid changing employer training needs.

_____ **Area Business**

Meeting the training needs of the local businesses is ATCs primary focus. As employers they are really the "customers" of ATCs product (students). We must set our goals with area businesses in mind. Good ATC planning will include a strong degree of input from the local business and industry representatives.

_____ **Area Politicians**

Must understand the importance of the ATC so they can help direct funding.

_____ **ATC Cultural Values**

The commitment to be customer focused. The commitment to be responsive to business needs and to respond quickly. The commitment to providing business training and assistance "better-faster, and cheaper."

Cultural Values

Impacting student recruitment is the perception that a liberal arts education is better than technical training.

Current Workers

Identifying the training needs of current employees is an area that internally is of great concern to building administrators.

Demographics

Responding to significant growth in minority populations in an ATC service area may require the provision of additional services such as English as a second language courses.

Economic Development Organizations

The service provided by ATCs can be one of the most important forces attracting new businesses to a region. In turn, the industries that are attracted to a region by an economic development organization may drive the programmatic offering of the ATC.

Economic/Market Forces

The ebb and flow of employers' training requests are a by-product of business trends. Some ATCs across the nation were designed and developed during a time when industry was contracting, while others were designed during the Internet explosion. The time and the needs of the time create differing demands that impact the planning and developing of the ATC. In general, market forces are the key factor in the overall strength of our ATC business.

Information Technologies (IT)

So much of what ATCs do involves computers and IT. ATCs must maintain state-of-the-art programs and must scrutinize the developments of the information technology industry.

Legislatures: Political/legal

An important external constituency is state legislatures because they determine the level of funding for ATCs. Technology changes so fast that maintaining current programs, both from a human resources and an equipment standpoint, is difficult without sufficient funding from the state legislature.

Other Educational Organizations - Public and Private

There are several ways to view other educational organizations. As an external partner it is important that they understand articulation and transfer options of ATC students. As external competition it is important to know what courses the competition is offering. Competition drives much of our energies – pricing, program development, packaging/delivery, marketing, quality control, customer service, etc.

Parent College or Organization

How the parent college or organization views the ATC and how the ATC is incorporated within the whole college mission is critical. So that the ATC is not seen as a competing element to the standard/traditional education services, how the parent college goes about the planning and developing phase of the ATC is critical to its future acceptance and success. The organization of many community colleges has the ATC outside the “normal” academic unit. It is therefore, its own separate unit, and often it is considered a “profit-center.” That designation sets up an external constituency known as, “the rest of the college.” Parts of the college look at the ATC as competition; parts of the college look at the ATC as collaborators; still others have no idea why it exists. This may be the most critical constituency to the ATCs survival. This constituency needs the most communication; this constituency needs the most relationship building; this constituency needs the most knowledge about what the ATC is doing.

_____ Taxpayers

Many taxpayers expect ATCs to provide higher quality services without additional tax increases.

THANK YOU FOR YOUR CONTRIBUTION

APPENDIX G
PANELIST DEMOGRAPHIC INFORMATION

PANELIST DEMOGRAPHIC INFORMATION

The following demographic information is requested in order to provide a profile of the panel only. This form is numerically coded to ensure confidentiality. Please do not place your name on the questionnaire.

Age

☐ Under 30
☐ 30 to 39
☐ 40 to 49
☐ 50 to 59
☐ 60 or older

Race/Ethnicity

☐ American Indian
☐ Asian
☐ Black, non-Hispanic
☐ Hispanic
☐ White, non-Hispanic

Gender

☐ Female
☐ Male

Number of Years as an ATC

Administrator

☐ 1 to 5
☐ 6 to 10
☐ 11 to 15
☐ 16 to 20
☐ 20 or more

Degree

☐ Bachelor's
☐ Master's
☐ C.A.S.
☐ Doctoral

When ATC Program was Established

____ Before 1979

____ 1980 to 1985

____ 1986 to 1990

____ 1991 to 1995

____ 1996 to 2001

**Average Number of Students Enrolled
at your ATC**

____ Under 500

____ 500 to 750

____ 750 to 1,000

____ 1,000 to 1,500

____ 1,500 or more

**Number of Years in Career and
Technical Education**

____ 1 to 5

____ 6 to 10

____ 11 to 15

____ 16 to 20

____ 20 or more

**What is/was your responsibility at
your ATC**

PLEASE RETURN BY JULY 2, 2001.**THANK YOU FOR YOUR TIME****AND ASSISTANCE.**

Demographic Variables

The following information was requested from each panelist: age, gender, highest degree held, race/ethnicity, number of years as an ATC administrator, when was the ATC program established, number of years working in career and technical education, average number of students enrolled at their ATC, and what is/was his/her responsibility at their ATC. Details from the responses of the demographic data request form are listed below. Considering that the panelists who participated in this study were nominated and not randomly selected, this group should not be assumed to represent accurately the entire population of facility administrators of urban ATCs. Demographic information does, however, provide a profile of those nominated and who elected to acknowledge that summons. All nine panelists returned a completed demographic data request form.

Age - Panelists were given five age groups from which to select: under 30, 30 to 39, 40 to 49, 50 to 59, above 60. Of the nine panelists, 11.1 percent reported to be in the 30 to 39 group, 22.2 percent in the 40 to 49 group, 55.6 percent in the 50 to 59 group, and 11.1 percent in the 60 or more group.

Gender - All nine panelists were males. Of note, four of the original seventeen nominees were females that declined to participate.

Degree Held - Study participants were asked to indicate their highest degree held. 44.4 percent responded that a master's degree was the highest degree held and 55.6 percent listed a doctorate.

Race/ethnicity - Given the choices of American Indian, Asian, Black non-Hispanic, Hispanic, or White non-Hispanic, 100 percent of the panelists chose White non-Hispanic.

Number of Years in Career and Technical Education - Study participants were given the following ranges of years to choose from: 1 to 5, 6 to 10, 11 to 15, 16 to 20, or 20 or more. Of the nine panelists, 11.1 percent selected 6 to 10, 22.2 percent selected 11 to 15, 22.2 percent selected 16 to 20, and 33.3 percent selected 20 or more.

Years as an ATC Administrator - Respondents were asked the number of years as an ATC administrator. The time spans provided on the form were 1 to 5, 6 to 10, 11 to 15, 16 to 20, and 20 or more. Of the nine panelists, 55.6 percent answered 1 to 5, 11.1 percent 6 to 10, 22.2 percent 11 to 15, and 11.1 percent 16 to 20.

When ATC Program Was Established? - To determine the age of the centers that the panelists were or are associated with, the following ranges were offered for selection: Before 1979, 1980 to 1985, 1986 to 1990, 1991 to 1995, 1996 to 2001. 22.2 percent respondents checked 1980 to 1985, 44.4 percent selected 1986 to 1990, 11.1 percent 1991 to 1995, and 22.2 percent 1996 to 2001.

Average Number of Students Enrolled at Your ATC - One center reported to have an average of under 500 students; one between 500 and 750; one between 750 and 1,000; one between 1,000 and 1,500; and four centers with 1,500 or more students.

What Is/Was Your Responsibility at Your ATC? - To this question panelists responded with just job titles or job titles and a brief description. The following are those responses as written:

- President;
- Dean, Workforce Development and Community services – All programs and services to business and industry;

- **Dean of Continuing Education responsible for the overall management of the facility;**
- **As dean of the division, I have full responsibility for all aspects of community education including all non-credit training for business and industry, all adult lit/ESL programming (over 3,000 students there alone), all public contracted IT training and other non-credit programs of the college;**
- **Executive Director;**
- **My responsibilities include the supervision of the day, evening, and weekend, instructional programs offered at this campus. These programs include Network Technology, Automated Manufacturing, Instrumentation Control, Computer Aided Design/drafting, Telecommunications, Electronics, Precision Machining/Computer Numerical Control Machining, and Welding;**
- **Director, responsible for general management, budget development and strategic planning of the center;**
- **Director of Industrial Programs;**
- **Director.**

All the centers are located within urban areas. Geographically, the location of the centers that the facility administrators were or are employed is diverse. One center is located in the West, one in the Northwest, two in the Midwest, one in the South, two from the Mid-Atlantic region, one in the Northeast, and one in a non-contiguous state.

APPENDIX H
COVER LETTER
DELPHI QUESTIONNAIRE III

Date

Name

Title

Agency Name

Address

City, State, Zip Code

Dear _____:

This is the final round of the ATC Delphi study. I want to commend you for your professionalism and thank you for your consistent support throughout this research project.

Provided on the Round III questionnaire are the external constituencies identified, with corresponding responses, your Round II rankings, the group rankings, and the upper and lower quartile range for each. The last round of the survey asks you to rethink your Round II rankings in light of the overall rankings of the group. If your final rankings fall below the lower quartile or above the upper quartile scores of the group, please write a brief statement explaining your rationale.

Please return the completed questionnaire by July 31, 2001. Your prompt response is appreciated.

If you have any questions or concerns, please do not hesitate to contact me at work (757) 473-5671, (757) 480-2057, or via e-mail at dansmith@vbcps.k12.va.us. Once again, thank you for your time and professionalism.

Sincerely,

Daniel R. Smith

DELPHI QUESTIONNAIRE III

Below are the external constituencies of urban advanced technology centers presented in the second round of this study. Along with each constituency is the median ranking for all respondents, your first rankings, and the lower quartile and the upper quartile scores for each. Please rank each of the external constituencies with consideration given to the group median response. If your final ranking for a constituency is above the upper quartile score or below the lower quartile score, please note the constituency and provide a brief explanation at the bottom of this form. Please return this survey by July 31, 2001. Thank you again for giving of your time and expertise.

1. Irrelevant to goal setting, goal achievement, effectiveness, and survival.
2. Limited relevance to goal setting, goal achievement, effectiveness, and survival.
3. Moderate relevance to goal setting, goal achievement, effectiveness, and survival.
4. Significant relevance to goal setting, goal achievement, effectiveness, and survival.
5. Most relevant to goal setting, goal achievement, effectiveness, and survival.

Final Ranking

Accrediting Agencies

Provide a framework of rules that ATCs must operate within. May be an impediment to adapting to rapid changing employer training needs.

Group ranking (median) = 2 Your ranking from Round II = ADD

Lower quartile score = 2 Upper quartile score = 3

Area Business

Meeting the training needs of the local businesses is ATCs primary focus. As employers they are really the "customers" of ATCs product (students). We must set our goals with area businesses in mind. Good ATC planning will include a strong degree of input from the local business and industry representatives.

Group ranking (median) = 5 Your ranking from Round II = ADD

Lower quartile score = NA Upper quartile score = NA

Area Politicians

Must understand the importance of the ATC so they can help direct funding.

Group ranking (median) = 3 Your ranking from Round II = ADD

Lower quartile score = 3 Upper quartile score = 4

ATC Cultural Values

The commitment to be customer focused. The commitment to be responsive to business needs and to respond quickly. The commitment to providing business training and assistance "better-faster, and cheaper."

Group ranking (median) = 5 Your ranking from Round II = ADD

Lower quartile score = 4.5 Upper quartile score = 5

Cultural Values

Impacting student recruitment is the perception that a liberal arts education is better than technical training.

Group ranking (median) = 3 Your ranking from Round II = ADD

Lower quartile score = 3 Upper quartile score = 4

Current Workers

Identifying the training needs of current employees is an area that internally is of great concern to building administrators.

Group ranking (median) = 4 Your ranking from Round II = ADD

Lower quartile score = 4 Upper quartile score = 5

Demographics

Responding to significant growth in minority and international populations in an ATC service area may require the provision of additional services such as English as a second language courses.

Group ranking (median) = 4 Your ranking from Round II = ADD

Lower quartile score = 2.5 Upper quartile score = 4

Economic Development Organizations

The service provided by ATCs can be one of the most important forces attracting new businesses to a region. In turn, the industries that are attracted to a region by an economic development organization may drive the programmatic offering of the ATC.

Group ranking (median) = 4 Your ranking from Round II = ADD

Lower quartile score = 4 Upper quartile score = 4.5

Economic/Market Forces

The ebb and flow of employers' training requests is a by-product of business trends. Some ATCs across the nation were designed and developed during a time when industry was contracting, while others were designed during the Internet explosion. The time and the needs of the time create differing demands that impact the planning and developing of the ATC. In general, market forces are the key factor in the overall strength of our ATC business.

Group ranking (median) = 4 Your ranking from Round II = ADD

Lower quartile score = 4 Upper quartile score = 5

Information Technologies (IT)

So much of what ATCs do involves computers and IT. ATCs must maintain state-of-the-art programs and must scrutinize the developments of the information technology industry. Without strong IT, we may not survive.

Group ranking (median) = 4 Your ranking from Round II = ADD

Lower quartile score = 4 Upper quartile score = 5

Legislatures - Political/legal

An important external constituency is state legislatures because they determine the level of funding for ATCs. Technology changes so fast that maintaining current programs, both from a human resources and an equipment standpoint, is difficult without sufficient funding from the state legislature.

Group ranking (median) = 4 Your ranking from Round II = ADD

Lower quartile score = 2.5 Upper quartile score = 4.5

Other Educational Organizations - Public and Private

There are several ways to view other educational organizations. As an external partner it is important that they understand articulation and transfer options of ATC students. As external competition it is important to know what courses the competition is offering.

Competition drives much of our energies – pricing, program development, packaging/delivery, marketing, quality control, customer service, etc.

Group ranking (median) = 3 Your ranking from Round II = ADD

Lower quartile score = 2.5 Upper quartile score = 3

Parent College or Organization

How the parent college or organization views the ATC and how the ATC is incorporated within the whole college mission is critical. So that the ATC is not seen as a competing element to the standard/traditional education services, how the parent college goes about the planning and developing phase of the ATC is critical to its future acceptance and success. The organization of many community colleges has the ATC outside the “normal” academic unit. It is therefore, its own separate unit, and often it is considered a “profit-center”. That designation sets up an external constituency known as, “the rest of the college”. Parts of the college look at the ATC as competition; parts of the college look at the ATC as collaborators; still others have no idea why it exists. This may be the most critical constituency to the ATCs survival. This constituency needs the most communication; this constituency needs the most relationship building; this constituency needs the most knowledge about what the ATC is doing.

Group ranking (median) = 4 Your ranking from Round II = ADD

Lower quartile score = 3.5 Upper quartile score = 5

Taxpayers

Many taxpayers expect ATC's to provide higher quality services without additional tax services.

Group ranking (median) = 2 Your ranking from Round II = ADD

Lower quartile score = 1.5 Upper quartile score = 4

If your final ranking for a constituency is above the upper quartile score or below the lower quartile score as reported for any of the constituencies, please note the constituency and provide a brief rationale of why your ranking is out of sync with the group as a whole.

APPENDIX I
PANEL OF SPECIALISTS

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Vernon W. King, Jr.
1709 Seaton Drive
Virginia Beach, Virginia 23464
757.479.2966

EDUCATION: Degree: B.S. Old Dominion University
 Year: 1977
 Major: Vocational Education with a Concentration in Marketing Education
 Degree M.S. Old Dominion University
 Year: 1985
 Major: Secondary education with a Concentration in Vocational Education

PROFESSIONAL:

Currently Electronic Commerce Instructor, Technical and Career Education Center. In my first year.
 Member of the Electronic Commerce Review Writing Team, 1999 – present.
 Chairperson Information Technology Committee, Technical and Career Education Center, 2000 – Present.
 Chairperson for Marketing and Promotion Committee Advanced Technology Center, 2000 – Present.
 Marketing Education Coordinator, Kempsville High School, Virginia Beach, 1977-2000 (23 years)
 Evening School Principal, Adult and Continuing education, 1986 – 1990.
 Chairman/Co-chairman Marketing Education Curriculum Committee.
 Member/Chairman-DECA Board of Trustees, Virginia DECA, 1984-1987 and currently servicing another 4-year term.
 Member/Chairman – DECA Policy and Planning Committee, 1979-1982.
 Member of Kempsville High School, Self-Study Evaluation Team, 1979 – 1982.
 Member of Marketing Education Evaluation Team evaluating Western Branch High School, Chesapeake, Virginia. 1979.
 District Advisor for District's 27 and 28, 1979-1981; 1990-1992; and 1998-2000.
 Adult Coordinator, Marketing Education Real Estate Program, 1977-1980.
 Kempsville High School Teacher of the Year 1987.
 Member of state curriculum development committee for electronic Commerce 1999-2000.
 Assistant Basketball Coach, Kempsville High School, 1977-1989.
 Head Basketball Coach, Kempsville High School, 1989-1997.

Jerry W. Stewart

**1053 Radcliff Landing
Virginia Beach, Virginia 23464
Home Telephone 757-495-1418
Work Telephone 757-437-6457
jwstewar@vbgov.com**

Education: University of Nebraska
Bachelor of Science in Business Administration
Major in Accounting

University of Oklahoma
Graduate of the Economic Development Institute

Certified Economic Developer
International Economic Development Council

Work History: *Department of Economic Development, City of Virginia Beach
July 1987 to Present*

As an Economic Development Representative II, my responsibilities include, but not limited to the following:

- Works in partnership with the director, coordinators and other members of the economic development process in achieving the desired outcomes of the Economic Development Strategy.
- Leads the existing business and retention program for the City of Virginia Beach.
- Assists new prospective businesses to locate in the city.
- Contributes to an effective and efficient organization by developing effective relationships with external and internal stakeholders.
- Participates in and leads implementation of business strategies
- Manages projects and initiatives on behalf of the VBDA and City.
- Establish and maintain effective relationships with city, regional, state and federal entities regarding economic development programs and projects.
- Applies the principles, methods and tools of Completed Staff Work and the City's Organizational Values in taking shared responsibility for and accomplishing the work of the strategy.
- Work with the public schools, higher education institutions, technical schools and other trainers for the development of a qualified workforce.

- Develop and maintain databases and reports for use by the department.
- Provide the first line of computer technical support for the staff.
- Responsible for the local area network.
- Active team facilitator for a city management level team.
- Co-producer for a quarterly economic development television program

Four years of real estate sales in Lincoln, Nebraska

Residential, commercial and agricultural real estate sales

Six years in aviation business located in Superior, Nebraska

Owner, manager, commercial pilot and flight training instructor

Committee: Chair, General Advisory Council for Technical and Career Education

Activities: Virginia Beach City Public Schools

Interagency Committee for the Adult Learning Center

Virginia Beach City Public Schools

Advanced Technology Center Technology Group

City of Virginia Beach, Virginia Beach City Public Schools,

Tidewater Community College

Computer Proficient with all programs in the Corel Suite

Skills: Proficient with all programs in the Office 2000 Suite

Proficient in the development of Access databases and the generation of reports

Network Administrator

DIANN S. HOLT

5117 Stratford Drive

Suffolk, VA 23435 (757) 484-5983

EDUCATION:

Ed.D., School Administration, Vanderbilt University, Nashville, TN, 1990

M.S., Vocational-Technical Education, VPI & SU, 1977

B.S., Business Education, Madison College (JMU), 1969

Numerous graduate credits from the following institutions: College of William and Mary, Virginia Commonwealth University, Central State University, James Madison University, Old Dominion University, University of Virginia

EMPLOYMENT:**Tidewater Community College, September 1978 to present****Special Assistant to the Dean for Occupational/Technical Education (June 2001 to present)**

- Provide program leadership for the college's occupational/technical programs.
- Provide overall coordination of the Tech Prep effort.
- Responsible for the development and maintenance of occupational/technical information: catalog, student handbook, SIS, brochures, website, etc.
- Responsible for process that appoints and maintains membership for all O/T advisory committees.
- Direct college-wide coordination of the IST programs.
- Provide leadership for development/occupancy of O/T programs in the Advanced Technology Center.

Chair, Business Division - Virginia Beach Campus (August 1992 to June 2001)

- Responsible for the planning, organizing, supervising, and evaluating of the instructional programs of the Business Division, which include: seven AAS degree programs, one AS degree program, and a variety of certificate and career studies programs in such fields as information systems, office technologies, accounting, management, marketing, legal assisting, and hospitality management.
- Manage a diverse group of personnel which include: computer lab assistants, network manager, lab manager, clerical staff, technical faculty in information systems, attorneys and judges teaching in the paralegal program, faculty with a background in the hospitality field, and those in the traditional business programs of accounting, management, marketing, and office technologies.
- Responsible for the supervision of 30 full-time faculty, 50-75 adjunct faculty, three full-time classified staff members, and seven part-time computer lab assistants.
- Successful management of a resource-intensive division with limited resources.
- Responsible for the supervision of a 200+ workstation Novell Network.
- Responsible for the layout and design of the computer labs for the new Virginia Beach Building (blue print already established).
- Transitioned the Business Division computer labs from a mainframe environment to the present lab configuration which consists of more than two hundred pentium workstations in nine labs operating under a Novell network and the IST course offerings from a mix of

PC-based software and mainframe-based languages in 1993 to a totally PC-based networked environment.

- Established an on-going partnership with local AS/400 installations and facilitated the division's participation in IBM's Partners in Education Program using the AS/400.
- Responsible for the development and implementation of the Network Engineer, Internet Specialist, AS/400, and the Database Administration (Oracle) curricula.
- Served as Chair of the Professional Development/Training Committee in 1995-1997.
- Facilitated the development of the division's Small Business Center and the International Business Practice Firm Model.
- Responsible for the coordination of offerings for the IST program college-wide.
- Responsible for the organization/occupation of the business offerings in the upcoming Advanced Technology Center.
- In conjunction with Navy personnel, developed the ITU (Information Technology University) program. Now in its second year, currently responsible for program operation.
- Participated in the Wharton Executive Education program, April 2000. Alongside team members, developed a student advising model for TCC.

EMPLOYMENT:

Tidewater Community College, September 1978 to present (continued)

Professor - Virginia Beach Campus (September 1978 to August 1992)

- Responsible for teaching courses in the Computer Information Systems (CIS) Department.
- Developed numerous CIS courses.
- Coordinated the CIS curriculum audit and chaired the assessment of the CIS curriculum.

Norfolk Public Schools, August 1969 to June 1978

Teacher - Norfolk Technical Vocational Center

- Team-taught data processing courses to students preparing to enter the work force in the data processing field.
- Responsible for computer-related curriculum development.
- Monitored work progress for advanced students in a work-release program.

RECENT PRESENTATIONS:

- "Preparing Qualified workers for the AS/400 Environment" at the Delta Pi Epsilon Research Conference, Louisville, Kentucky, November 1998
- "A Working Partnership Between Business, Industry, and Tidewater Community College," San Antonio, Texas, June 1999
- "Chair/Faculty Relationship" at New Faculty Orientation, TCC, August 2000
- "Information Technology University: A Learning Partnership" at the Navy's Connecting Technologies Conference, Virginia Beach, Virginia, May 2001
- "Chair/Faculty Relationship" at New Faculty Orientation, TCC, August 2001

RECENT AWARDS:

- Virginia Council for Career and Technical Education Award, 1997: Facilitated the development of a faculty internship program with the City of Virginia Beach to bring "real world" work experience to validate the network training faculty have received. This interaction with the city resulted in a two-year training program for city employees.
- Virginia Council on Career and Technical Education Award, 1998: Established a business partnership with local AS/400 installations in which TCC provided a curriculum to train individuals for work in the AS/400 environment. In exchange, the business partners provided technical support, internships, and promises of jobs. IBM provided a campus-based AS/400. TCC became thirtieth school in the nation to participate in IBM's Partners in Education Program.
- Virginia Council on Career and Technical Education Award, 1999: Facilitated the faculty development of a Small Business Center on campus that would use advanced students to assist small business owners in the development of their businesses.
- Virginia Council on Career and Technical Education Award, 2000: Created a learning partnership with Fleet Combat Training Center Atlantic at Dam Neck. Developed an AAS Degree in IST: Network Engineer which would be delivered in one year to active duty sailors. Program in second year with plans underway for a third year.
- Virginia Council on Career and Technical Education Award, 2001: Facilitated the faculty development of the International Business Practice Firm Model in conjunction with the guidelines set forth by Mercer College. Our class firm partnered with a local business, Wave Riding Vehicles.

MEMBERSHIPS

ACE-VIP

Bennetts Harbor Association

Delta Pi Epsilon

Data Processing Management Association (1978 - 1993)

Newsletter Editor - 1989-1991

Information Technology Exchange (1998-2000)

Special Education Advisory Committee (SEAC) proposed for 2001-2002, Suffolk Public Schools

APPENDIX J
DELPHI QUESTIONNAIRE I RESULTS

DELPHI QUESTIONNAIRE ROUND I RESULTS

Note: The number sign and number corresponds to the code used to identify panel members.

#12

Area Business and Economic and Market Forces

These two constituencies are grouped together because they are nearly one in the same in my mind. These two factors are the reason ATCs exist. We get our goals from these factors, define our effectiveness through them, and depend on them for our survival.

While many of our ATCs exist for academic instruction, many more of them exist because we can respond to the in-service training needed by area businesses, and we can respond to the changing needs of the market and job force with specialized programs.

What sets ATCs apart from other “trainers” is the hands-on nature of the training.

Theory is combined with contextual learning. Area businesses need that type of specific training and ATCs respond to those needs. Therefore, we must set our goals with area businesses in mind. Without the evaluation from these businesses (our customers), and without feedback and constant communication, we would not know how to survive.

Information Technologies

So much of what our ATCs do involves computers and IT. It is a must for our goals because of the cost involved. We cannot ignore either the cost effectiveness of “better” IT, nor the ease with which IT allows us to plan and solve issues. Many of our customers

have IT needs that we can fill. IT, therefore, becomes a part of everything we do. It is almost like having a telephone on one's desk. There are also many forms of IT. There is simply the desktop that we all use for word processing and email. There is the computer lab in which we teach many different applications courses or hardware courses. There is also the higher level IT that "runs" our systems and allows us to respond to quickly (and hopefully) effectively to our customers. We are on the IT edge because we need to be ahead of our customers, if we can, so we can provide them with quality, knowledgeable workers. Without strong IT, we cannot be responsive to the community and our customers. Without strong IT, we may not survive. Our competition will beat us to our own customers. This "constituency," therefore, becomes critical to our success.

Our Own College

This constituency does not show on the chart, but it is a critical one and it is, in many colleges, an external constituency. The organization of many of our community colleges has the ATC outside the "normal" academic unit. For example, it is not part of the Division of Arts and Sciences or Division of Business and Technology. It is therefore, its own separate unit, and often it is considered a "profit-center." That designation sets up an external constituency known as, "the rest of the college." It is a double-edged sword. Parts of the college look at the ATC as competition; parts of the college look at the ATC as collaborators; still others have no idea why it exists. All of these responses are reflected in the goal setting and goal achievement of the ATC (in colleges where this type of venue exists). While the ATC may be outside the academic units, it is nonetheless part of the management system of the entire institution. Strategic planning, budget

development, goal setting, vision development are all accomplished with “academicians” who may or may not have any idea what the ATC does or accomplishes. Therefore, this may be the most critical constituency to the ATCs survival. This constituency needs the most communication; this constituency needs the most relationship building; this constituency needs the most knowledge about what the ATC is doing. It may be difficult for “our own college” to measure our success effectively without truly understanding what we do; yet it is critical that understanding occur.

#1

Economic Market Forces

Until recently, corporations were desperate for trained employees. Demand for training was very high although the irony was production schedules were so tight employers could not let employees leave the line for training. Now many area companies are experiencing slow downs and layoffs. They still need training but have fewer people and are cutting training budgets. In general, market forces are the key factor in overall strength of our ATC business.

Political/Legal

Particularly the political part ... In this state the governor has made workforce development a key factor for attracting and retaining business. Consequently he has made millions of dollars available for employers to use in training and that money (\$11M this year) is only available through community colleges or state universities. This has resulted in significant business for ATCs.

Area Businesses

Those that are potential customers have been covered in the Econ/Market comments above. But many area businesses are competition for our ATC. Most evident is the computer (IT training industry), which includes several national companies and enjoys very large and aggressive sales/marketing support. But we also get significant competition from area consulting firms, for-profit technical schools/training institutes, and distance delivery organizations providing on-line training. Competition drives much of our energies – pricing, program development, packaging/delivery, marketing, quality control, customer service, etc. With money available for training, competition in this state has become keen as more training providers set-up shop.

Taxpayers

Who expect the colleges to provide more services with less tax support (hence the need for the ATC as a revenue generator).

Area Politicians

Who exercise influence over the local WIB.

Demographics

Which includes a very significant growth in minority populations – especially those with weak English-speaking skills.

#13

Area Businesses

As employers they are really the “customers” of your product (students). They are also in touch with the needs of other constituencies or situations such as cultural values and societal conditions.

Economic Development Organizations

The service provided by ATCs can be one of the most important forces attracting new business to the region. These organizations can provide the ATC with valuable information about new business opportunities and the programs ATCs need to concentrate on.

Other Educational Organizations

Provide information about the educational level and workforce skills of incoming students. Your ATC students must also know that the educational programs at the ATC can lead to further educational opportunities at colleges and universities.

Area Politicians

Must understand the importance of the ATC so they can help direct funding that will help your cause.

#3

Economic/Market Forces

Economic and market forces will drive the ebb and flow of need for ATC services.

Area Business

There must be sizeable business to support an ATC.

Business must be engaged and responded to.

ATC Cultural Values

The commitment to be customer focused.

The commitment to be responsive to business needs and to respond quickly.

The commitment to providing business training and assistance “better faster, and cheaper.”

#8

State Economic Development Department

Two new businesses – 250 employees

Area Businesses

218 training contracts

Local Economic Development Organizations

Four new businesses – 1280 employees

Legislatures – No comment

Accrediting Agencies – No Comment

#2

Economic and Market Forces – No comment

Area Businesses – No comment

Demographic Characteristics – No comment

Parent College or Organization

The four selected external constituencies have a great impact on the planning, development, and operation of an ATC. While external agencies, governments, and others will have impact on initial funding and design, the local economy and industry needs, the condition of the local workforce (demographics) and the parent college/organization itself will have the greatest impact on how functional the ATC will be ultimately.

All four will be influenced by the calendar. Some ATCs across the nation were designed and developed during a time when industry was contracting, while others were designed during the Internet explosion. The time and the needs of the time create differing demands that impact the planning and developing of the ATC.

Good ATC planning will include a strong degree of input from the local business and industry representatives. As the local businesses will be the main users of the ATC goods and services, their early buy-in is better guaranteed by their early and sustained involvement.

How the parent college or organization views the ATC and how the ATC is incorporated within the whole college mission is critical. So that the ATC is not seen as a competing element to the standard/traditional education services, how the parent goes about planning and developing phase of the ATC is critical to its future acceptance and success.

#17

Cultural Values

Impacting student recruitment is the perception that a liberal arts education is better than technical training.

Legislatures

While it is not the case in my state, the funding for technical education impacts the quality of programs that ATCs may offer.

Area Business

When business and industry do not value educational partnerships, the information exchange and internal financial support suffer.

#4

Legislatures

An important external constituency is state legislatures because they determine the level of funding for our programs.

Other Educational Institutions – Public and Private

It is important to know what the competition is offering. ATCs are trying to attract the same students.

Information Technology Industry

ATCs must maintain state-of-the-art programs and as such must scrutinize the developments of the information technology industry.

#9

Area Business

Meeting the training needs of the local businesses is ATCs primary focus.

Current Workers

Identifying the training needs of current employees is an area that internally is of great concern to building administrators.

Legislatures

Technology changes so fast that maintaining current programs, both from a human resources and an equipment standpoint, is difficult without sufficient funding from the state legislature.

Economic and Market Forces

The ebb and flow of employers' training requests are a by-product business trends. In times of heightened economic activity, the internal impact of meeting the training needs of employers can be quite intense.

APPENDIX K

DELPHI QUESTIONNAIRE II RESULTS

ROUND II RESULTS**ACCAGE**

Value Label		Value	Frequency	Percent	Valid Percent	Cum Percent
		1	1	11.1	11.1	11.1
		2	5	55.6	55.6	66.7
		3	3	33.3	33.3	100.0
		<hr/>		<hr/>	<hr/>	
	Total		9	100.0	100.0	
Median	2.000	Range	2.000	Minimum	1.000	Maximum 3.000
Percentile	Value	Percentile	Value	Percentile	Value	
	25.00	2.000	50.00	2.000	75.00	3.000
Valid cases	9	Missing cases	0			

AREABUS

Value Label		Value	Frequency	Percent	Valid Percent	Cum Percent
		5	9	100.0	100.0	100.0
		<hr/>		<hr/>	<hr/>	
	Total		9	100.0	100.0	
Range	.000	Minimum	5.000	Maximum	5.000	
Percentile	Value	Percentile	Value	Percentile	Value	
	25.00	.	50.00	.	75.00	.
Valid cases	9	Missing cases	0			

ROUND II RESULTS**AREAPOL**

Value Label		Value	Frequency	Percent	Valid Percent	Cum Percent		
		2	1	11.1	11.1	11.1		
		3	4	44.4	44.4	55.6		
		4	3	33.3	33.3	88.9		
		5	1	11.1	11.1	100.0		
			<hr/>	<hr/>	<hr/>	<hr/>		
		Total	9	100.0	100.0			
Median	3.000	Range	3.000	Minimum	2.000	Maximum	5.000	
Percentile	Value	Percentile	Value	Percentile	Value			
	25.00	3.000	50.00	3.000	75.00	4.000		
Valid cases	9	Missing cases	0					

ATCCULVA

Value Label		Value	Frequency	Percent	Valid Percent	Cum Percent		
		4	2	22.2	22.2	22.2		
		5	7	77.8	77.8	100.0		
			<hr/>	<hr/>	<hr/>	<hr/>		
		Total	9	100.0	100.0			
Median	5.000	Range	1.000	Minimum	4.00	Maximum	5.000	
Percentile	Value	Percentile	Value	Percentile	Value			
	25.00	4.500	50.00	5.000	75.00	5.000		
Valid cases	9	Missing cases	0					

ROUND II RESULTS**CULVAL**

Value Label		Value	Valid Frequency	Cum Percent	Percent	Percent		
		1	1	11.1	11.1	11.1		
		3	4	44.4	44.4	55.6		
		4	3	33.3	33.3	88.9		
		5	1	11.1	11.1	100.0		
		Total	9	100.0	100.0			
Median	3.000	Range	4.000	Minimum	1.000	Maximum	5.000	
Percentile	Value	Percentile	Value	Percentile	Value			
	25.00	3.000	50.00	3.000	75.00	4.000		
Valid cases	9	Missing cases	0					

CURWKER

Value Label		Value	Valid Frequency	Cum Percent	Percent	Percent		
		3	1	11.1	11.1	11.1		
		4	5	55.6	55.6	66.7		
		5	3	33.3	33.3	100.0		
		Total	9	100.0	100.0			
Median	4.000	Range	2.000	Minimum	3.000	Maximum	5.000	
Percentile	Value	Percentile	Value	Percentile	Value			
	25.00	4.000	50.00	4.000	75.00	5.000		
Valid cases	9	Missing cases	0					

ROUND II RESULTS**DEMOG**

Value Label		Value	Frequency	Percent	Valid Percent	Cum Percent	
		1	1	11.1	11.1	11.1	
		2	1	11.1	11.1	22.2	
		3	1	11.1	11.1	33.3	
		4	5	55.6	55.6	88.9	
		5	1	11.1	11.1	100.0	
			-----	-----	-----		
Total			9	100.0	100.0		
Median	4.000	Range	4.000	Minimum	1.000	Maximum	5.000
Percentile	Value	Percentile	Value	Percentile	Value		
25.00	2.500	50.00	4.000	75.00	.000		
Valid cases	9	Missing cases	0				

ECODEV

Value Label		Value	Frequency	Percent	Valid Percent	Cum Percent
		3	1	11.1	11.1	11.1
		4	6	66.7	66.7	77.8
		5	2	22.2	22.2	100.0
			-----	-----	-----	
Total			9	100.0	100.0	
Median	4.000	Range	2.000	Minimum	3.000	Maximum 5.000
Percentile	Value	Percentile	Value	Percentile	Value	
25.00	4.000	50.00	4.000	75.00	4.500	
Valid cases	9	Missing cases	0			

ROUND II RESULTS**ECOMAR**

Value Label		Value	Frequency	Percent	Valid	Cum		
					Percent	Percent		
		3	1	11.1	11.1	11.1		
		4	5	55.6	55.6	66.7		
		5	3	33.3	33.3	100.0		
		<hr/>		<hr/>	<hr/>			
Total			9	100.0	100.0			
Median	4.000	Range	2.000	Minimum	3.000	Maximum	5.000	
Percentile	Value	Percentile	Value	Percentile	Value			
25.00	4.000	50.00	4.000	75.00	5.000			
Valid cases	9	Missing cases	0					

EDORG

Value Label		Value	Frequency	Percent	Valid Percent	Cum Percent		
		2	2	22.2	22.2	22.2		
		3	6	66.7	66.7	88.9		
		4	1	11.1	11.1	100.0		
		-----		-----	-----			
Total			9	100.0	100.0			
Median	3.000	Range	2.000	Minimum	2.000	Maximum	4.000	
Percentile	Value	Percentile	Value	Percentile	Value			
25.00	2.500	50.00	3.000	75.00	3.000			
Valid cases	9	Missing cases	0					

ROUND II RESULTS**INFOTEC**

Value Label		Value	Frequency	Percent	Valid Percent	Cum Percent
		4	5	55.6	55.6	55.6
		5	4	44.4	44.4	100.0
			-----	-----	-----	
	Total		9	100.0	100.0	
Median	4.000	Range	1.000	Minimum	4.000	Maximum 5.000
Percentile	Value	Percentile	Value	Percentile	Value	
25.00	4.000	50.00	4.000	75.00	5.000	
Valid cases	9	Missing cases	0			

LEGISLA

Value Label		Value	Frequency	Percent	Valid Percent	Cum Percent	
		2	2	22.2	22.2	22.2	
		3	2	22.2	22.2	44.4	
		4	3	33.3	33.3	77.8	
		5	2	22.2	22.2	100.0	
			-----	-----	-----		
	Total		9	100.0	100.0		
Median	4.000	Range	3.000	Minimum	2.000	Maximum	5.000
Percentile	Value	Percentile	Value	Percentile	Value		
25.00	2.500	50.00	4.000	75.00	4.500		
Valid cases	9	Missing cases	0				

ROUND II RESULTS**PARCOLL**

Value Label		Value	Frequency	Percent	Valid Percent	Cum Percent
		3	2	22.2	22.2	22.2
		4	3	33.3	33.3	55.6
		5	4	44.4	44.4	100.0
			-----	-----	-----	
	Total		9	100.0	100.0	

Median	4.000	Range	2.000	Minimum	3.000	Maximum	5.000
Percentile	Value	Percentile	Value	Percentile	Value		
25.00	3.500	50.00	4.000	75.00	5.000		
Valid cases	9	Missing cases	0				

TAXPAY

Value Label		Value	Frequency	Percent	Valid Percent	Cum Percent
		1	2	22.2	22.2	22.2
		2	3	33.3	33.3	55.6
		3	2	22.2	22.2	77.8
		5	2	22.2	22.2	100.0
			-----	-----	-----	
	Total		9	100.0	100.0	
Median	2.000	Range	4.000	Minimum	1.000	Maximum 5.000
Percentile	Value	Percentile	Value	Percentile	Value	
25.00	1.500	50.00	2.000	75.00	4.000	
Valid cases	9	Missing cases	0			

APPENDIX L
DELPHI QUESTIONNAIRE III RESULTS

Round III Results**ACCAGE**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	1	11.1	11.1	11.1
	2	6	66.7	66.7	77.8
	3	1	11.1	11.1	88.9
	4	1	11.1	11.1	100.0
	Total	9	100.0	100.0	

Median 2.000 Range 3.000 Minimum 1.000 Maximum 4.000

Percentile	Value	Percentile	Value	Percentile	Value
25.00	2.000	50.00	2.000	75.00	2.500

Valid cases 9 Missing cases 0

AREABUS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	5	9	100.0	100.0	100.0
	Total	9	100.0	100.0	

Range .000 Minimum 5.000 Maximum 5.000

Percentile	Value	Percentile	Value	Percentile	Value
25.00	.	50.00	.	75.00	.

Valid cases 9 Missing cases 0

Round III Results**AREAPOL**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	3	5	55.6	55.6	55.6
	4	3	33.3	33.3	88.9
	5	1	11.1	11.1	100.0
	<hr/>		<hr/>	<hr/>	
	Total	9	100.0	100.0	

Median 3.000 **Range** 2.000 **Minimum** 3.000 **Maximum** 5.000

Percentile	Value	Percentile	Value	Percentile	Value
25.00	3.000	50.00	3.000	75.00	4.000

Valid cases 9 **Missing cases** 0

ATCCULVA

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	4	1	11.1	11.1	11.1
	5	8	88.9	88.9	100.0
	<hr/>		<hr/>	<hr/>	
	Total	9	100.0	100.0	

Median 5.000 **Range** 1.000 **Minimum** 4.000 **Maximum** 5.000

Percentile	Value	Percentile	Value	Percentile	Value
25.00	5.000	50.00	5.000	75.00	5.000

Valid cases 9 **Missing cases** 0

Round III Results**CULVAL**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	1	11.1	11.1	11.1
	3	5	55.6	55.6	66.7
	4	3	33.3	33.3	100.0
	<hr/>		<hr/>	<hr/>	
	Total	9	100.0	100.0	

Median 3.000 **Range** 3.000 **Minimum** 1.000 **Maximum** 4.000

Percentile	Value	Percentile	Value	Percentile	Value
25.00	3.000	50.00	3.000	75.00	4.000

Valid cases 9 **Missing cases** 0

CURWKR

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	4	6	66.7	66.7	66.7
	5	3	33.3	33.3	100.0
	<hr/>		<hr/>	<hr/>	
	Total	9	100.0	100.0	

Median 4.000 **Range** 1.000 **Minimum** 4.000 **Maximum** 5.000

Percentile	Value	Percentile	Value	Percentile	Value
25.00	4.000	50.00	4.000	75.00	5.000

Valid cases 9 **Missing cases** 0

Round III Results**DEMOG**

Value Label		Value	Frequency	Percent	Valid Percent	Cum Percent	
		1	1	11.1	11.1	11.1	
		2	1	11.1	11.1	22.2	
		4	7	77.8	77.8	100.0	
		<hr/>		<hr/>	<hr/>		
	Total		9	100.0	100.0		
Median	4.000	Range	3.000	Minimum	1.000	Maximum	4.000
Percentile	Value	Percentile	Value	Percentile	Value		
25.00	3.000	50.00	4.000	75.00	4.000		
Valid cases	9	Missing cases	0				

ECODEV

Value Label		Value	Frequency	Percent	Valid Percent	Cum Percent		
		3	1	11.1	11.1	11.1		
		4	6	66.7	66.7	77.8		
		5	2	22.2	22.2	100.0		
			-----	-----	-----			
	Total		9	100.0	100.0			
Median	4.000	Range	2.000	Minimum	3.000	Maximum	5.000	
Percentile	Value	Percentile	Value	Percentile	Value			
25.00	4.000	50.00	4.000	75.00	4.500			
Valid cases	9	Missing cases	0					

Round III Results**ECOMAR**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	4	6	66.7	66.7	66.7
	5	3	33.3	33.3	100.0
	<hr/>		<hr/>	<hr/>	
Total		9	100.0	100.0	

Median 4.000 **Range** 1.000 **Minimum** 4.000 **Maximum** 5.000

Percentile	Value	Percentile	Value	Percentile	Value
25.00	4.000	50.00	4.000	75.00	5.000

Valid cases 9 **Missing cases** 0

EDORG

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	2	1	11.1	11.1	11.1
	3	6	66.7	66.7	77.8
	4	2	22.2	22.2	100.0
	<hr/>		<hr/>	<hr/>	
Total		9	100.0	100.0	

Median 3.000 **Range** 2.000 **Minimum** 2.000 **Maximum** 4.000

Percentile	Value	Percentile	Value	Percentile	Value
25.00	3.000	50.00	3.000	75.00	3.500

Valid cases 9 **Missing cases** 0

Round III Results**INFOTEC**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	4	5	55.6	55.6	55.6
	5	4	44.4	44.4	100.0
		<hr/>	<hr/>	<hr/>	
Total		9	100.0	100.0	

Median 4.000 **Range** 1.000 **Minimum** 4.000 **Maximum** 5.000

Percentile	Value	Percentile	Value	Percentile	Value
25.00	4.000	50.00	4.000	75.00	5.000

Valid cases 9 **Missing cases** 0

LEGISLA

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	2	2	22.2	22.2	22.2
	3	3	33.3	33.3	55.6
	4	2	22.2	22.2	77.8
	5	2	22.2	22.2	100.0
		<hr/>	<hr/>	<hr/>	
Total		9	100.0	100.0	

Median 3.000 **Range** 3.000 **Minimum** 2.000 **Maximum** 5.000

Percentile	Value	Percentile	Value	Percentile	Value
25.00	2.500	50.00	3.000	75.00	4.500

Valid cases 9 **Missing cases** 0

Round III Results**PARCOLL**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	3	2	22.2	22.2	22.2
	4	3	33.3	33.3	55.6
	5	4	44.4	44.4	100.0
	<hr/>		<hr/>	<hr/>	
	Total	9	100.0	100.0	

Median 4.000 **Range** 2.000 **Minimum** 3.000 **Maximum** 5.000

Percentile	Value	Percentile	Value	Percentile	Value
25.00	3.500	50.00	4.000	75.00	5.000

Valid cases 9 **Missing cases** 0

TAXPAY

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	2	22.2	22.2	22.2
	2	3	33.3	33.3	55.6
	3	4	44.4	44.4	100.0
	<hr/>		<hr/>	<hr/>	
	Total	9	100.0	100.0	

Median 2.000 **Range** 2.000 **Minimum** 1.000 **Maximum** 3.000

Percentile	Value	Percentile	Value	Percentile	Value
25.00	1.500	50.00	2.000	75.00	3.000

Valid cases 9 **Missing cases** 0

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