THE ILLINOIS MATHEMATICS AND SCIENCE ACADEMY: A CASE STUDY OF THE CREATION OF AN ORGANIZATIONAL CULTURE

HATCHER, CONSTANCE JOSEPH
DEGREE DATE: 1990

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ABSTRACT

Name: Connie Jo Hatcher
Department: Leadership and Educational Policy Studies

Title: The Illinois Mathematics and Science Academy: A Case Study of the Creation of an Organizational Culture

Major: Educational Administration
Degree: Doctor of Education

Approved by: Date:

[Signature]
Dissertation Director

NORTHERN ILLINOIS UNIVERSITY
ABSTRACT

The study examined the creation of an organizational culture at the Illinois Mathematics and Science Academy. The study focused on the concept of change and the effects of change on the organization and the organizational participants since the creation of the Academy in 1985. Changes in the structure and management of the Academy provided the basis for participant response.

The Illinois Mathematics and Science Academy is a public, three-year, residential school for students from the State of Illinois who are highly gifted in mathematics and science. Selected students enter having completed the ninth grade. The rigorous comprehensive curriculum, with strong emphasis on mathematics and science, supports active student learning, experimentation, exploration, and investigation. In the fourth year, the Academy enrollment totalled 560 with full enrollment of 760 anticipated in the fall of 1992.

A case study methodology was used with the researcher acting as a participant observer. Open-ended interviews were conducted with nineteen faculty members and five administrators who represented personnel hired in the first three years of operation. Participants were asked to share their perceptions of change in management and structure at the Academy over the first four years of operation and the effects of change on the Academy as an organization, themselves as organizational participants, and their colleagues as organizational participants.
The data gathered in the interviews was categorized into eight areas of management and structure with sub-categories emerging from the interview data. The eight major categories were: (a) size of the student body, (b) size of the faculty and administration, (c) governance, (d) funding, (e) curriculum, (f) leadership, (g) decision making, and (h) other issues of change. Quantitative and qualitative analysis of the data generated findings that were supported by the research literature relating to organizational culture, organizational change, other ethnographic studies in educational communities, and research done at the Academy in the first year of operation.
THE ILLINOIS MATHEMATICS AND SCIENCE ACADEMY:
A CASE STUDY OF THE CREATION
OF A
ORGANIZATIONAL CULTURE

A DISSERTATION SUBMITTED TO THE GRADUATE SCHOOL
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE
DOCTOR OF EDUCATION

DEPARTMENT OF LEADERSHIP AND EDUCATIONAL
POLICY STUDIES

BY
CONNIE JO HATCHER

DEKALB, ILLINOIS
DECEMBER.1990
Certification: In accordance with departmental and Graduate School policies, this dissertation is accepted in partial fulfillment of degree requirements.

[Signature]
Dissertation Director

Date

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CHAPTER I
INTRODUCTION TO THE STUDY

The educational reform calls of the 1980s heightened the accountability of the educational delivery system and of the people who comprise the educational communities. Traditional educational practices, programs, and pedagogies were examined and assessed to determine how students could realize a greater benefit from a system that so dramatically impacts their life. Illinois responded to the reform calls with Senate Bill 730, The Comprehensive Educational Reform Package. The creation of the Illinois Mathematics and Science Academy was part of the package aimed at responding to the need to improve mathematics and science education for the state and nation. The Illinois Mathematics and Science Academy, IMSA, established in 1985, is a residential high school for students from the State of Illinois who are highly gifted in mathematics and science. The State pays the cost of residency and instruction for all students selected. IMSA is one of six schools of its type in the United States and is the only three-year school.

IMSA, being a new and unique school organization, underwent substantial change in its first four years. Because of IMSA's importance as an educational institution devoted to the advancement of instruction in mathematics and science and because its brief history has been marked by enormous adaptation from the first day it opened, IMSA constitutes a very important and interesting educational setting to examine
closely. The educational implications on the adaptations IMSA has made to meet the needs of gifted children are important for all educators and the organizational adaptations are important for educators and for students of organizations generally.

**Problem Statement**

The problem of this study is to examine the perceptions of selected IMSA faculty members and administrators, as expressed in interviews, about the changes in IMSA's management and organizational structures and the impact those changes had on the organization, on them as individual organizational participants, and on their colleagues from the inception of the Academy in 1985.

**Significance of the Study**

This study has particular significance with relation to the following aspects:

1. As a unique educational endeavor and community, any findings relating to the Academy are in themselves significant.
2. While other educational communities may not be the same, the findings may be instructive and have implications for other research and change efforts.
3. The findings may have implications for other educational communities with similar or unique missions.
Limitations of the Study

1. The findings will have limited generalizability to other communities and settings due to the unique nature and mission of the Illinois Mathematics and Science Academy.

2. The study focuses on the perceptions of selected faculty and administration of the Academy. Broader focus, to include other personnel, may have yielded other data and other implications.

3. The perceptions of the interviewees, within the context of their personal reality, may represent many individual realities.

4. The possibility of observer bias must be noted.

Definition of Terms

The terms in this study are defined as follows:

1. Anthropology
   The scientific study of the origin and the physical, social and cultural development and behavior of humans (Webster, 1984).

2. Change
   Transform; to lay aside, abandon, or leave for another; to become different; transition from one state or phase to another (Webster, 1984).
   Innovation, rebuilding; the crystallization of new action possibilities (new policies, new behaviors, new patterns, new methodologies, new products, or new market ideas) based on reconceptualized patterns and construction of new patterns, or the reconceptualization of old
ones, to make new, and hopefully more productive, actions possible (Kanter, 1983).

3. Community

An ecological system; a system of organisms in a natural environment; a social and ethical system; an environment of men, a mental life, and an artifactual life (Redfield, 1967). A capacity of relatedness, not only of people but to events in history, to nature, to the world of ideas, to things of the spirit (Palmer, 1987).

4. Culture

Social energy that moves people to act (Kilmann et al., 1985). "A web of meaning we ourselves have spun" (Weber, cited in Sergiovanni & Corbally, 1984, p. 158). Social invention created to give meaning to human endeavor (Deal, 1987). Integrated pattern of human behavior that includes thought, speech, action, artifacts, and depends on man’s capacity for learning and transmitting knowledge to succeeding generations (Deal & Kennedy, 1982). Social structure of a community (Redfield, 1967). Deeper level of basic assumptions and beliefs that are shared by members of an organization, that operate unconsciously, and that define an organization’s view of itself and its environment (Schein, 1985). The totality of socially transmitted behavior patterns, arts, beliefs, institutions, and all other products of human work and thought typical of a population or community at a given time (Webster, 1984). A continuing dialogue that revolves around pivotal areas of concern in a given community (Spindler & Spindler, 1985). A pattern of basic assumptions that a given group has invented, discovered, or developed in learning to cope with its problems of external adaptation and internal integration; a pattern of assumptions that has worked well enough to be considered valid and therefore, to be taught
to new members as the correct way to perceive, think, and feel in relation to those problems (Schein, 1983).

5. **Entrepreneur**

One who organizes, operates, and assumes the risk in a business venture in expectation of gaining a profit (Webster, 1984).

6. **Ethnography**

The study of culture, the cultural process, and cultural knowledge; the study of the dialogue of action and interaction; direct observation in a field situation that allows one to collect and elicit the native view(s) of reality and the native ascription of meaning to events intentions, and consequences (Spindler & Spindler, 1985). The descriptive anthropology of technologically primitive societies (Webster, 1984).

7. **Ethos**

"Goodness"; mixture of the parts that produce a whole; the people, structure, relationships, ideology, goals, intellectual substance, motivation, and will (Lightfoot, 1986). A value system internalized; the code of conduct, a system of values that dominates and controls the culture and behavior (Redfield, 1967).

8. **Management**

The organizing, controlling, coordinating, and directing of the structure (Katz & Kahn, 1978). The act, manner, or practice of managing, supervising, or controlling; executive skill (Webster, 1984).

9. **Professional Growth and Development**

Growth is the development from a lower or simpler to a higher or more complex form; an evolution (Webster, 1984). Professional references one's career and experiences in a field or activity; professional refers to a livelihood
Development references the realization of potential and gradual expansion of growth (Webster, 1984).

10. **Structure**

The manner in which parts are arranged or combined to form a whole; the interrelation of parts in a complex entity; relatively intricate or extensive organization; to give form or arrangement to (Webster, 1984).

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**Organization and Reporting of the Study**

Chapter I of the study states the problem, significance, and limitations of the study. In addition, the key terms are defined that pertain to the study and the organization of the study is stated. Chapter II is a review of the literature directly related to the study in the areas of (1) organizational change, (2) organizational culture, (3) educational ethnographic studies, and (4) previous research at the Illinois Mathematics and Science Academy. Chapter III describes the methodology and procedures of the study as it describes the population being studied, the research methodology, procedures for data collection and analysis, and reporting of the data. Chapter IV is a description of the setting. Chapter V is a reporting of the findings of the study and Chapter VI is the discussion and implications of the study.
CHAPTER II

REVIEW OF THE RELATED LITERATURE AND RESEARCH

The purpose of this study was to uncover the perceptions of selected faculty and administrators of the Illinois Mathematics and Science Academy about changes in management and structure and the impact these changes had on the organization, on them as organizational participants, and on their organizational colleagues. The review of related literature and research included the concepts of (1) change in educational communities, (2) the culture of educational communities, (3) other ethnographic studies in educational communities, and (4) the findings compiled from research done in the first year of operation of the Illinois Mathematics and Science Academy.

The literature addressing the concept of change relates to organizational change and the effects of change on the organization and its members. The creation of the Academy was a direct result of the Illinois Comprehensive Education Reform Package of 1985 calling for a change in the educational delivery system for gifted and talented students in Illinois. The literature addressing the culture of educational communities and other ethnographic studies conducted in educational communities relates to the unique mental and social life of communities that directly affects the perceptions and realities of the members of the community. The research findings of the first year of operation provide a base of reference for the perceptions of the faculty and
administration as the Academy grew and evolved over the first four years of operation. This chapter reviews each concept as it relates to the purpose of the study.

**Change In Educational Communities: A Historical Perspective**

Educational communities are by nature conservative and supportive of the status quo (Meyer & Rowan, 1983; Saleh, 1987). Historically, the most significant change in schools happened as a result of the Progressive Era and the Efficiency Movement (Fuller & Izu, 1986). Taylor (1932) and Callahan (1962) note that educational reform was evidenced most in the structure of schools with the Efficiency Movement of the 1930s when schools were subjected to the scientific management theories of the time (cited in Deal, 1986). Chapey (1985) professes that the resistance to change of schools since the 1930s is a direct result of the movement as it created schools in the classical Weberian, bureaucratic, management model. Although many of the effects of the Efficiency Movement are still evident in the bureaucracy of educational systems, Argyris (1962, cited in Deal, 1986) states that the Human Relations Movement of the 1950s and 1960s attempted to replace efficient schools with humanistic schools. The results of the Human Relations Movement is evidenced today in many of the supervisory and instructional practices in schools that emphasize morale as a precondition to high performance.

During the 1970s, researchers responded to the rapidly changing technology that impacted and affected educational settings and instructional practices. Lawrence and Lorch (1967, cited in Deal, 1967) began examining the correlation between organizational structure and effectiveness,
concluding that structure needs to be tailored individually to fit with the environment. Based on this assumption, Deal, Meyer, and Scott (1975, cited in Deal, 1986) conducted research that supported the assumption proposing that educational organizations operate independently at different structural levels in response to technology and environmental imperatives. Weick (1976, cited in Deal, 1986) supports the assumptions of the researchers stating that educational systems are loosely coupled organizations with unique properties of (1) unclear goals, (2) ambiguous technology, and (3) political vulnerabilities. The theory of loose coupling in schools prevailed in the 1980s noting that educational communities are loosely coupled in their response to environmental factors and tightly coupled in response to core values and beliefs, with both responses resulting in resistance to change and reform (Weick, 1982).

Deal (1986) notes that in the 1980s, more than any decade preceding, public attention was called to the need for school reform with the stimulus for change and reform led by the presidentially appointed commissions and state gubernatorial responses to the perceived crisis that existed in American education. Considering the human and material resources that were channeled toward the reform calls of the 1980s, one would expect observable benefits and dividends in practices and performance. However, Deal (1986) contends that the reform calls of the 1980s are more symbolic with the benefit being realized in the ability of educators to believe differently rather than significant differences being realized in observable practices and performance. He further believes that it is best to fashion reform efforts away from performance criteria and toward the individual, political, and
symbolic reality of schools where changes in beliefs will affect change in the classroom.

**Change In Educational Communities: A Socio-Psychological Perspective**

Welch (1979), Berman and McLaughlin (1977), and Fullan (1982, cited in Corbett, Firestone, & Rossman, 1987) contend that there is little evidence of change in schools because of the resistance to change by teachers. Fullan (1982, cited in Corbett, Firestone, & Rossman, 1987) states the "change depends on what teachers do and think - it is as simple as that" (p. 107). Lortie (1975, cited in Corbett, Firestone, & Rossman, 1987) supported this premise stating that teachers are stubborn in their resistance to change and attributes it to the selection and socialization process of schools with the degree of resistance dependent upon the fit between the culture of the school and the proposed change. Corbett, Firestone, and Rossman (1987) support the premises stating that change redefines what is and what ought to be in a school, with the proposed change challenging the professional identity of teachers. The teachers' resistance is a reaction to their perception that they are being asked to change who they are. Such resistance is supported by Sarason (1971) as he noted teachers resist change in common values, beliefs, and norms that they consider to be sacred. Corbett, Firestone, and Rossman (1987) further clarify the sacreds to be those norms, values, and beliefs that define professional purpose and although they may not be shared uniformly, they are the most powerful and most resistant to change.
Harding, Kaplan, Sahlins, and Service (1960) note that all cultures are continually changing, that change is constant, even though the principle of stabilization is functioning. It is this difference between stabilization through a change process that differs from resistance to change that results in a static state and stagnation. Adaptation is the response to change that facilitates evolution of life and culture while stabilizing the environment that is affected, thus bringing some conformity to variations in individual behavior (Harding, Kaplan, Sahlins, & Service, 1960). Individual resistance, coupled with a tightly coupled group resistance to perceived changes in professional purpose, are more understandable in this context as we examine the social-psychological stance of resistance to change in educational settings. Harding says it best stating:

> Whether a culture is stable or changing then, depends on the relative strength of the contending forces, habits or wishes, education or itches! (p. 61)

Deal (1987) examined the research dealing with the resistance to change in educational settings citing three major conditions that facilitate the resistance:

1. Professional educators lack required skills and are negatively disposed toward change. (Baldridge & Deal, 1983)

2. Changes fail because roles are improperly defined or because adequate levels of interdependence and coordination do not exist. (Corwin 1972; Baldridge & Deal, 1983)
3. The "law of the jungle" prevails in which desired changes fall short because they threaten the balance of power, create opposing coalitions and trigger conflict. (Baldridge, 1975)

Deal (1987) also notes that the research of Marris (1974) found that change carries with it a sense of loss. If the loss is perceived as loss of personal and professional identity and challenges the core values of the community, the change is perceived as threatening to self efficacy and self control (Deal, 1987). Deal (1987) also notes that educators are caught in a paradox of calls for reform and change as two decades of demands for change also expect the school to maintain the traditional script of expected behaviors that are stable.

Chapey (1985) notes that educators are still struggling with the conflicting notions about the purpose and goals of education having never made the transition from the Industrial Age to the Information Age. Stuck in what Chapey (1985) calls the Weberian model of bureaucracy, schools are resistant to change because of the structure that imposes barriers on the change process thus leaving a static environment. The static state, opposed to a dynamic state, of the educational community is characterized by the following:

1. Authoritarian leadership
2. Archaic structure with excessive layers of management
3. Mechanistic approach to problem solving; repeat whatever was done before
4. Isolation of teachers from decision making
5. No sunset policy for programs that are no longer workable or needed
6. Interdisciplinary planning not encouraged
7. Quantitative oriented managers lack an understanding of the psychology of the organization
8. The spirit of adventure and risk and experimentation are lacking

Chapey (1985) believes that the Type A school manager is trapped in a myriad of rules, regulations, and procedures that prohibit attempts at change and transition of programs and systems that meet the needs of the Information Society. Chapey ties her research to the need for creative and visionary leadership, coupled with a strong organizational culture, before change in educational communities will be realized (Barron, 1969; Bennis, Benne, & Corey, 1976; Chapey, 1977; Dewey, 1910; Frederiksen, 1982; Guilford & Hoepfner 1971; Likert, 1967; Maslow, 1954; McGregor, 1966; Merrifield, 1984).

**The Concept of Change in Organizations**

Although the review of literature addressing the concept of change was limited to educational change, the corporate literature was accessed on a limited basis because of what appeared to be applicability by the researcher. Rosabeth Moss Kanter (1983) addressed the concepts of change, innovation, enterprise, and initiative by individuals in the American corporation. In *The Change Masters*, Kanter (1983) examined the entrepreneurial spirit of individuals and companies as they anticipated and facilitated change to bring about a "Corporate Renaissance". In her most recent book, *When Giants Learn To Dance*, Kanter (1989) examines what she calls the "post-entrepreneurial" company that "creates a marriage between entrepreneurial creativity and corporate discipline,"
cooperation, and teamwork" (p. 10). Kanter states that her work on *When Giants Learn to Dance* allowed her to use two worlds of ideas as she continued to work at Harvard University as a professor drawing on the intellectual knowledge provided her at Harvard and the business knowledge provided her through her personal business practice as a cofounder and consultant for a private corporation. In support of the applicability of her observations and premises found in her research to other settings, Ms. Kanter professes that "it all depends" as she supports the organizational development contingency theory. She believes that research findings depicted in the book can help everyone and every organization to become masters, rather than victims, of the change process.

Kanter (1989) views change as creative innovation and revolution with the resulting revolution being the post-entrepreneurial organization. The change process that demands creative innovation may also require "creative destruction" of the old ways or replacing the dinosaurs through adaptation to new innovation (Kanter, 1989). This is similar to Deal's (1987) concept of mourning the loss realized in the change process. Kanter (1989) notes the evolutionary process of change is more marked in business and scary and threatening to educational communities.

Kanter (1989) summarizes what she calls demands for personal and business change for improved performance and excellence as:

1. Think strategically and invest in the future
2. Be entrepreneurial and take risks
3. Do everything you are doing but better; spend more time on communication and teamwork
4. Know every detail of business and delegate responsibility
5. Become passionately dedicated to vision and fanatically committed to carrying out, but be flexible, responsible, and change directions quickly
6. Speak up, be a leader; participate, listen, cooperate
7. Throw yourself in wholeheartedly to entrepreneurship; long hours and stay fit
8. Succeed, succeed, succeed — and raise terrific children

Kanter (1983) spoke of "cultures of pride" within high performance organizations in which individuals evidenced a confidence in themselves and others, took more risks, and were more innovative and adaptive to change. In her recent research of "post-entrepreneurial" organizations, Kanter (1989) observed a responsiveness and teamwork effort that was more (1) focused, (2) fast, (3) friendly, and (4) flexible. She refers to the groups as "newstreams" as opposed to mainstreams with the most significant differences witnessed in newstream organizations having (1) high autonomy, (2) high uncertainty, and (3) high intensity. Kanter (1989) also notes that Newstreams call for:

1. Committed, visionary leadership willing to initiate and sustain effort on the basis of ideas
2. Existence of "patient money" - capital that does not have to show short-term return
3. A great deal of planning and flexibility, to adjust original concepts to emerging realities

Kanter (1989) notes that mainstreams have (1) momentum, (2) an established path, (3) prestige and legitimacy,
(4) commitments made, and (5) power that resists change; while new streams have (1) unclear paths, (2) unclear rhythm and momentum, (3) little referral or use of past performance, (4) react quickly to opportunity or inspiration, and (5) are uncertain and controversial. Such organizations emphasize synergy that decreases the vertical dimension of the organization and increases the horizontal dimension. The organization becomes flatter in structure with alliances, partnerships and entrepreneurial enclaves encouraged (Kanter, 1989).

The Culture of Educational Communities

The organizational culture school of thought is the most recent and controversial theory to emerge in the field of organizational development (Shafritz & Ott, 1987). Based in the premise that the study of organizations may not best be accomplished through traditional, quantitative, scientific research, the cultural school of thought relies more heavily on qualitative data (Shafritz & Ott, 1987). Emerging in the 1970s, Shafritz and Ott (1987) note the early research on culture was more representative of "pop culture" with the first comprehensive, theoretically based research findings being published in 1984 and 1985 (Kilmann, Saxton, Serpa, & Associates, 1985; Sathe, 1985; Schein, 1985; Sergiovanni & Corbally, 1984). Shafritz and Ott (1987) note that because the organizational culture school of thought is relatively new and controversial, theorists are not in agreement on all the concepts relating to the theory. However, there is agreement in the field on the following issues:
1. Organizational cultures exist.
2. Each organizational culture is relatively unique.
3. Organizational culture is a socially constructed concept.
4. Organizational culture provides organizational members with a way of understanding and making sense of events and symbols.
5. Organizational culture is a powerful lever for guiding organizational behavior. It functions as "organizational control mechanisms, informally approving or prohibiting some patterns of behavior" (Martin & Siehl, 1983, cited in Shafritz & Ott, 1987).

During the review of the literature, the researcher found the relationship between the literature dealing with organizational change and organizational culture. Attempts were made to address each area of literature without totally overlapping assumptions and premises and yet show the relevance of each body of literature to the purpose of the study.

Redfield (1967), employing ethnographic methods of research, found that any community, whether primitive or civilized, can be studied scientifically by studying the artifacts, customs, and technological systems that typify it. However, Redfield (1967) further notes that analysis of the social structure is the most widely used method for understanding a community and gives the fullest meaning to the study of any culture. Redfield (1967) believes that it is the study of the mental life of a community and the social alignment of the relationships within the community that comprise the ideas and ideals of a group and that these are best studied through examining and understanding the
traditions, sentiments, norms, and aspirations of the members of the community. In the study of a given community, a researcher observes the ethical and social system of the community that goes beyond the ecological system to determine the system of values and ideals that dominate and control the behavior of the members and create the ethos of the community (Redfield, 1967). Community members live partly in terms of what they think ought to be and partly in terms of what actually is: In stable communities these terms are congruent and the ethos of the community is the value system internalized for the community members (Redfield, 1967). Redfield (1967) notes that in stable communities, where the ethical and social systems are aligned and the core values of community members are observable and identifiable, the passage of people and the adaptation to change and survival is natural. Redfield (1967) notes that some changes are cyclic with similarities to a life cycle that realizes birth and death: It is the core values, rituals, and traditions that facilitate this passage and change in stable communities. The researcher who engages in ethnographic research in the study of culture finds that the communication of the research findings is more acceptable and appropriate to the natural sciences as observable thoughts, experiences, and beliefs of the people studied are defined and described (Redfield, 1967).

Schein (1983) bases his study of organizational culture on premises similar to those of anthropologists with less scientific study of artifacts and more attention to the mores, values, and philosophy of a community. Schein (1983) defines culture as:

A pattern of basic assumptions that a given group has invented, discovered, or developed in learning.
to cope with its problems of external adaptation and internal integration - a pattern of assumptions that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems. (p. 14)

Schein (1983, 1985) ties many of his premises relating to the development of a strong and cohesive culture to the founder or founders of the organization and the leaders of the community. Founding and first generation members of a community know each other well and function more on personal acquaintance and trust than on formal structures, principles, job descriptions, and rules with founder biases providing an initial basis for group identity (Schein, 1983). Evolution and cultural change in the early life of an organization is best achieved through hybrid models developed by community members and heavily based in community values and assumptions (Schein, 1983). As a culture matures, it will undergo specific changes in response to external forces to the extent of preserving unchanged its fundamental structure and character (Harding, Kaplan, Stahlins, & Service 1960).

Sergiovanni and Corbally (1984) view organizations as symbolic abstractions; it is the individual intention and action that create social reality of an organization. Therefore, understanding the experiences of the individuals, not the organization, more clearly defines the organizational culture (Sergiovanni & Corbally, 1984). Martin and Siehl (1983) support the premise in their view that culture is a socially constructed reality by members of the community. Weber (cited in Sergiovanni & Corbally, 1984, p. 158) summarizes the view as he stated: "Culture is a web of meaning we ourselves have spun."
In a summary of school research in the 1970s and 1980s, Fuller and Izu (1986) found that the Effective School Research focused too much on student achievement (Bookover, Beady, Flood, Schweitzer, & Wisenbaker, 1979), the role of the principal (Bossert, Dwyer, Rowan, & Lee, 1982; Edmonds & Frederiksen, 1978) and the force of internal and external environmental factors (Bacharach, 1981) and too little with educators agreement on fundamental instructional practices and organizational beliefs and structure. Fuller and Izu (1986) note that research, in order to be more powerful, should be directed toward the school culture and cultural beliefs and values of teachers, for these are the factors that most influence the teachers sense of efficacy and affect the teachers commitment to and effectiveness in classroom practices. Johnson (1987) agrees with the premise noting effective schools are judged too much by their artifacts (i.e. performance scores) rather than the culture that produced them. Lightfoot (1986), in her research of six designated effective schools, examined through a process of "portraiture" the culture of the schools that contributed to the effectiveness. She found that "good" or effective schools were educative and nurturant environments for teachers. Lightfoot's (1986) research findings revealed that teachers experienced a self-discovery process in which they began to discover their own theories and interpretations of their practice, thus reflecting on their role, goals, values, and beliefs.

Johnson (1987) studied school culture by examining the values of the community, what he considers to be the guideposts that articulate the philosophy of the school and give basis to the correctness of individual and collective behavior. Johnson (1987) also ties his research to strong leadership within the community citing that who is chosen to lead and
model behaviors to a great extent determines the common values of the community. Although the stories, rituals, and ceremonies guide the behavior and dramatize a school's core values, the core values, if widely shared and accepted, determine:

1. What will be attended to diligently
2. Who or what is most respected in the community
3. How far individuals can advance or move in the organization
4. What people will work on and how hard they will work
5. What the outside world will expect of the school

Johnson (1987) notes that core values are stated qualitatively rather than quantitatively, are capable of inspiring people at the lowest levels of the organization, and clarify a stand on an issue.

Although the literature pertaining primarily to the concept of leadership in educational communities is not included in the review of the literature, one piece was deemed to have implications for the study. The specific literature refers to the culture of educational communities in which women hold the leadership roles. Shakeshaft (1988) found that an "altered environment" is created when women hold the leadership roles in schools. Jones (1986) found that schools where women held leadership roles had environments that were more collaborative with decision making decentralized. Sweeney (1982, cited in Shakeshaft, 1988) found that women conceptually think differently from their male counterparts with their primary emphasis in schools focusing on the following:
1. Individuals are the most important link to success.
2. Teaching and learning are the major focus with emphasis on achievement and instructional programs with more supervision of instructional staff.
3. Building of community is an essential part of the school with a more democratic and participative environment.

Sweeney (1982) notes that such focus results in higher job satisfaction of personnel, higher morale, and greater commitment to community goals and mission. Kanter (1977) supports the premise but notes that the environmental changes are dependent upon the ratio of women to men with a negative climate realized if women are only in positions as token status.

The most recent literature relating to organizational culture addresses the concept of "organizational social cognition" (Sims, Gioia, & Associates, 1986). The concept is based on the premise that "thinking and thought are the lifeblood of organizations, that social cognition lies at the heart of decision making, communication, strategic action, interpersonal behavior, organization design, and virtually every other important organizational process" (Sims, Gioia, & Associates, 1986, p. ix). The book provides a collection of perspectives from various authors as they examine the "thinking organization" within the three constructs of (1) foundation concepts for organizations, (2) transitions from concept to practice, and (3) applications of social cognition to organizations.
Ethnographic Studies in Educational Communities

Several ethnographic cases studies served as a base of reference for the study. They span three decades and provide a broad scope of social issues in a variety of educational settings.

Wax, Wax, and Dumont (1964) conducted a study on the Pine Ridge American Indian Reservation in South Dakota entitled Formal Education in an American Indian Community. The study focuses on the social processes of the contemporary community, especially on the formal educational system. As a research proposal, Wax, Wax, and Dumont (1964) examined previous ethnographic studies of the Dakota people to establish "a background for how "Indians" and "Whites" meet, avoid, educate, guide, manipulate, thwart, and live with each other" (p.v). The research findings closely parallel those of urban and slum communities at the time. Although the findings can not be summarized in this study, it is interesting to note that many of the people of Pine Ridge expressed their feelings that the study was important and urgent (Wax, Wax, & Dumont, 1964).

Goldhammer and Farner (1964) conducted a case study entitled The Jackson County Story. The researchers studied, through ethnographic procedures, a community in conflict undergoing internal and external changes. Specific focus centered on the governance and leadership of the school in a transitional stage.

Singleton (1967) conducted what he labeled "a cross-cultural rice roots" study entitled NICHU: A Japanese School. Singleton's research was one of a series of case studies in education and culture designed to clarify for students in professional education and the social sciences the results of
direct observation and participation in the educational process in a variety of cultural settings. In the true anthropological view, education is viewed as a cultural process and an instrument of adaptation and change (Singleton, 1967). It was the intent of the series to provide a cross-cultural view of the educational experience and to view education in a variety of settings without ethnocentric bias.

Cusick (1973) conducted a case study in a central high school with the findings published as Inside High School: The Student's World. Cusick (1973) engaged in the research to better understand what students see and think as they participate in the education process and their relationship to the school environment. Cusick acknowledged that such a study was complicated due to the fact that a school is a dynamic and multi-faceted organization, with a perceived nature that varies according to the individual and collective perspectives of the members. In support of ethnographic research, Cusick states:

Essentially, what we want is an explanation of the students' perspective which Tamotsu Shibutani defines as "an ordered view of one's world; what is taken for granted about the attributes of various objects, events and human nature.....the best method with which to carry on such a study is the field method used by anthropologist, that of participant observation. (pp. 2, 4)

Lightfoot (1986) conducted a case study of six schools designated to be "good" or "effective." Two suburban, two urban, and two proprietary schools were selected and through a process of "portraiture," Lightfoot made observations, conducted interviews, reviewed critical documents, and "hung
out" to assess what factors and conditions empowered teachers to be more effective in their roles. Lightfoot was looking for what she called "goodness" in schools, a multifaceted definition of school effectiveness. She found that the perceptions of the actors, the creators of the school culture, were best able to define and articulate the meaning.

**IMSA/INSYS Research Data from the First Year of Operation at the Illinois Mathematics and Science Academy**

During the first year of operation, the Academy Board of Trustees were committed to developing a research base and ongoing research relating to the Academy, the students, and the personnel. As part of the commitment, School Administrator Service Associates developed and administered questionnaires for all professional personnel, students, and parents in an effort to gather pertinent data relating to the Academy's mission and achievements. The Illinois Mathematics and Science Academy Information System, referenced as IMSA/INSYS, provided several volumes of data in the first year. The IMSA/INSYS provided a base of data that would assist in tracking and assessing the effectiveness of the educational process at the Academy and provide information about the Academy with reference to decision making, research, and outreach (School Administrator Service Associates, 1986-87). A review of the data gathered from faculty and administrators served as a base of reference in developing this proposal.

The data gathered from faculty and staff pertained to the following six measures of success as well as background information relating to choices to come to the Academy:
1. Job satisfaction
2. Professional life/work as Central to Life Interests
3. Faculty/staff Individual Success
4. IMSA Success
5. IMSA Products and Services Compared to Other Schools
6. IMSA Perceived Organizational Effectiveness

The data gathered from the questionnaires was both quantitative and qualitative as the narrative responses provided a less quantifiable body of data. The return of questionnaires from faculty and administration was 100%, however, the response to all items varied from 71% to 100% (School Administrators Service Associates, 1986-87).

The background information relating to choice to come to the Academy revealed the following as having moderate to high influence for faculty:

1. Wanted professional growth (100%)
2. Wanted to work with unique student population (100%)
3. Had prior commitment to goals and philosophy behind IMSA (89%)
4. Wanted greater professional creativity (89%)
5. Wanted professional advancement (83%)

Background information gathered from administrators revealed the following factors as having moderate to high influence with reference to choice to come to the Academy:

1. Wanted professional growth (100%)
2. Wanted professional advancement (80%)
3. Wanted greater professional creativity (80%)
4. Wanted expansion of responsibilities (80%)
5. Wanted greater Professional autonomy (80%)
6. Wanted a change in work location (80%)
7. Wanted to meet new people (80%)
8. Wanted change in assignment/duties (80%)
9. Had prior commitment to goals and philosophy behind IMSA (80%)

With reference to job satisfaction, 83% of the faculty and 100% of the administrators responded with both groups indicating a moderately high overall job satisfaction. Faculty, on a range of 7-35, had a mean score of 27.5 and a standard deviation of 2.6. Administrators, on a range of 7-35, had a mean score of 26.7 and a standard deviation of 1.4.

With reference to professional life/work as central to life interests, 83% of the faculty responded indicating a moderately high centrality and 100% of the administrators responded indicating a moderately high centrality. On a range of 7-35, faculty had a mean score of 24.5 with a standard deviation of 3.7 and administrators had a mean score of 24.4 with a standard deviation of 3.3.

With reference to individual success, 83% of the faculty and 100% of the administrators responded with both indicating a moderately high perception of individual success. On a range of 1-5, the faculty mean score was 3.9 with a standard deviation of .8 and the administrator mean score was 3.8 with a standard deviation of .4.

With reference to the Academy's success, 83% of the faculty and 100% of the administrators responded indicating perceptions of moderately high success. On a range of 2-5, the faculty mean score was 3.8 with a standard deviation of .8 and the administrator mean score was 3.8 with a standard deviation of .6.
With reference to the products and services of the Academy as compared to other schools, 83% of the faculty and 100% of the administrators responded indicating perceptions of a moderately high quality of Academy products and services relative to other secondary schools. On a range of 1-5, the faculty mean was 4.4 with a standard deviation of .6 and the administrator mean was 4.1 with a standard deviation of .4.

With reference to organizational effectiveness, 83% of the faculty and 100% of the administrators responded indicating perceptions of moderately high organizational effectiveness. On a range of 8-40, the faculty mean was 34.3 with a standard deviation of 4 and the administrator mean was 31.7 with a standard deviation of 2.7.

Although the narrative data revealed diverse opinions of faculty and administrators, some recurrence of focus on work and time overloads and funding were cited as conditions hindering achievement of goals. Recurring conditions that were cited as helping in the achievement of goals included:

1. Administrative support, including encouragement, approval, recognition, commitment to new ideas, high expectations, and opportunities for input into decision making.
2. The students, including student capabilities and openness and the challenge of learning with them.
3. Professional colleagues, including professional competence, enthusiasm, cooperation, mutual respect for talents, trust, and unity.
4. The IMSA environment, including experimentation, innovations, flexibility, academic freedom, risk taking, and a commitment to success.

The IMSA/INSYS data is far more extensive than can be reviewed adequately or appropriately in this format.
CHAPTER III
METHODOLOGY AND PROCEDURES

This chapter contains an overview of the research methodology, a description of the informants who participated in the interviews, a description of data collection procedures and of the process that generated the interview protocol, methods of data analysis, and a plan for reporting the data.

Methodology

The research methodology used in this study was that of a case study. A historical investigative process produced data that served as a base for the narrative history of the Academy and open-ended interviews with selected members of the faculty and administration produced data for analysis of organizational changes in management and structure. The researcher was a participant observer in the sense that she is now and has been a member of the Academy's administrative staff from the very first day of the Academy's existence.

Description of Informants

In the fourth year of operation, at the time of this study, the Academy faculty and administration was comprised of a total of fifty-seven full time professionals who filled
forty-four (44) faculty positions and eleven (11) administrative positions. Of the forty-four faculty (44), eleven (11) were hired for the first year and remain at the Academy, twelve (12) were hired for the second year and remain at the Academy, thirteen (13) were hired for the third year and remain at the Academy, and eight were hired for the fourth year and remain with the Academy. This number (n=44) represents 80% of all full-time faculty hired during the four year period.

Of the current eleven (11) administrators, seven (7) were hired for the first year and five (5) remain at the Academy, two (2) were hired for the second year and remain at the Academy, one (1) was hired for the third year and remains at the Academy, and three (3) were hired for the fourth year and remain at the Academy. This number (n=11) represents 84.6% of all administrators hired during the four year period.

Because the study dealt with the perceptions of faculty and administrators about organizational change and the effects of these changes on the Academy, themselves, and their colleagues, fourth year faculty and administrators were excluded from the study due to their limited exposure to the community. From those full-time teachers and administrators from the first three years of operation who are now working at the Academy, a 49% stratified random sample was chosen for interviews to participate and the need for representativeness among first, second, and third personnel, informants from different subject areas and from differing levels of administration. Twenty-four (24) persons, as noted in Appendix A, participated in the open-ended interviews. The division of those informants is shown in Table 1. The Academy Director, Principal, and Director of Academic Programs, three key persons in the enterprise were included as
representatives of the administration and the position of Assistant to the Director was not included because the position is held by this researcher.

Table 1: Informants by Group and Duration of Employment

<table>
<thead>
<tr>
<th>Category of Informants</th>
<th>Number of Faculty</th>
<th>Size of Sample</th>
<th>%</th>
<th>Number of Admin.</th>
<th>Size of Sample</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Years of Service</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Year</td>
<td>11</td>
<td>6</td>
<td>54.5</td>
<td>4</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>Second Year</td>
<td>12</td>
<td>6</td>
<td>50.0</td>
<td>2</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>Third Year</td>
<td>13</td>
<td>7</td>
<td>53.8</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>36</td>
<td>19</td>
<td>52.8</td>
<td>7</td>
<td>5</td>
<td>71.4</td>
</tr>
</tbody>
</table>

Description of Data Collection

Structured, open-ended interviews were conducted to collect the data for the study. Selected informants received a letter (Appendix B) requesting their participation in the interviews. Of the original twenty-four selected informants, only one chose not to participate. As a result, the researcher selected an alternate using the table of random numbers as used in the original selection of informants. Each participant agreed to the audio taping of the interviews. The researcher met with each informant in a mutually agreeable location and posed questions from the interview protocol (Appendix C) and asked follow-up questions as necessary to clarify an answer or to probe a point of interest. The interview protocol was
shared with the participants at the time of the interview but not prior to the interview. The researcher conducted each interview. The anticipated duration of each interview was thirty minutes. The interviews actually ranged from twenty-five to ninety minutes.

Generating the Interview Protocol

The history of the Academy, as described in Chapter IV, was written as a result of review of historical documents and the researcher's personal knowledge due to her role as an administrator from the initial planning phase and opening of the Academy. A review of the literature, as noted in Chapter II, focused on the concepts of (1) change in educational communities, (2) the culture of educational communities, (3) other ethnographic studies in educational communities, and (4) the findings compiled from research done in the first year of operation of the Academy. The initial protocol (Appendix D) for the interviews was based on the review of the related literature and the history of the Academy.

The initial protocol was field tested with two of the informants in an effort to determine the viability of the questions. The open-ended interview format used was intended to evoke a variety of perceptions, however, the field test indicated that the participants struggled with the broad perspective of organizational change and asked for more specific focus relating to areas of structure and management. As a result of the field test, the researcher modified the protocol (Appendix C) in an effort to provide the informant with categorical areas of change in management and structure. The revised protocol questions focused on events and
experiences derived from the researcher's working knowledge of the key events which transpired during the history as well as those that emerged from the field testing of the initial protocol.

The questions asked of informants were intended to touch on pivotal events and experiences which in turn may have had an important impact on the Academy, the respondent, and his or her colleagues. The interviews were intended to uncover patterns of perceptions about key events and the effects of those events rather than uncover factual data, per se. It was intended that the responses to interview questions would focus on organizational issues rather than psychological ones although it was expected that respondents may offer important information about the psychological impact of these organizational events. Question number 4 of the interview (Appendix C) asked the participant what other questions should have been asked about the Academy that affected personal and professional growth. It was interesting to note that this question evoked the most "passionate" perceptions and those that dealt most closely with psychological impact. Only in those cases where psychological information informed the organizational effects of events was this information used.

Therefore, the interview focused on three areas:

1. Informant perceptions of changes in management and organizational structure during the life of the organization.
2. Informant perceptions of how those changes affected the professional life (and to some extent the personal life) of the respondent as an organizational participant.
3. Informant perceptions of how those changes affected the professional life (and to some
extent the personal life) of other persons in the organization as organizational participants.

Categorizing the Data

The following details the interview questions, the subsequent probes, and sub-categories that emerged during the interviews with the participants. The four interview questions addressed the concept of change within the context of eight (8) areas of change in structure and management. Participants shared their perceptions relating to the areas in which they had witnessed change. Therefore, not all participants responded to each of the probing areas. The data relating to the eight (8) areas were further categorized into emerging sub-categories. As a result, Chapter V is a presentation of the findings of the study based on the analysis of data within the eight categories and emerging sub-categories of organizational change at the Academy.

The first three questions in the interview addressed perceptions of changes in management and structure and the impact of the changes. The following categories served as prompts for response for each question:

A. Size of the student body
B. Size of the faculty and administration
C. Governance
D. Funding
E. Curriculum
F. Leadership
G. Decision making
H. Other Issues of Change
As a result of analysis of the data gathered, specific sub-categories of change, within each categorical prompt, emerged relating to the change. The following describes the categorical prompts and subsequent sub-categories that emerged.

Size of the Student Body

The student body at the Academy grew from 210 students in the charter class in 1986 to a three class total of 494 students in the fall of 1989. Table 2 reflects the growth in the student population over the first four years.

Table 2: Four-Year History of Student Population

<table>
<thead>
<tr>
<th>Entering Year</th>
<th>86-87</th>
<th>87-88</th>
<th>88-89</th>
<th>89-90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class of 89</td>
<td>210</td>
<td>183</td>
<td>172</td>
<td></td>
</tr>
<tr>
<td>Class of 90</td>
<td></td>
<td>197</td>
<td>178</td>
<td>169</td>
</tr>
<tr>
<td>Class of 91</td>
<td></td>
<td></td>
<td>160</td>
<td>135</td>
</tr>
<tr>
<td>Class of 92</td>
<td></td>
<td></td>
<td></td>
<td>189</td>
</tr>
<tr>
<td>Totals</td>
<td>210</td>
<td>380</td>
<td>510</td>
<td>493</td>
</tr>
</tbody>
</table>

The rapid growth in a three year period was in itself a dramatic change. However, as a result of analysis of the data gathered in the interviews, the following issues emerged as changes that occurred as a result of the change in size of the
student body and the process of evolutionary change and growth in the first three years.

1. Formation of policy and rules
2. Dynamics between and differences between classes
3. Loss of sense of intimacy, sense of family; less personal
4. Change in quality of students and behavior
5. Increased options and choices for students
6. Decision not to grow to population of 900
7. Absence of change

Size of the Faculty and Administration

The faculty in the fall of 1986 totalled 14.25 full-time equivalents teaching a comprehensive, yet limited curriculum to the charter class of 210 students. The administration in the first year totalled 7. Table 3 details the growth in numbers personnel at the Academy in the first four years of operation. The table reflects the growth of all areas of personnel even though the interview sample included on faculty and administration. As a point of clarification and data reference, all areas of personnel are detailed due to the specific impact perceived as a result of growth or additions of functions of all personnel at the Academy.
Table 3: Four-Year History of Growth in Personnel

<table>
<thead>
<tr>
<th>Year of Hire</th>
<th>87-88</th>
<th>88-89</th>
<th>89-90</th>
<th>90-91</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty</td>
<td>14.25</td>
<td>35.75</td>
<td>46.5</td>
<td>50.25</td>
</tr>
<tr>
<td>Administration</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>Support/Leadership</td>
<td>1.5</td>
<td>8.5</td>
<td>25</td>
<td>35.5</td>
</tr>
<tr>
<td>Supervisors</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Custodial/Maintenance</td>
<td>5</td>
<td>8</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Security</td>
<td>4</td>
<td>7</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Residential Counselors</td>
<td>9</td>
<td>18</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>Secretarial</td>
<td>11</td>
<td>17</td>
<td>23</td>
<td>27</td>
</tr>
<tr>
<td>Totals</td>
<td>53.75</td>
<td>105.25</td>
<td>151.5</td>
<td>173.75</td>
</tr>
</tbody>
</table>

As a result of analysis of the data, the following issues emerged as specific areas of change in relation to the size of the faculty and administration:

1. Diversity of people and ideas
2. Loss of family structure of the 1st year
3. Loss of intimacy
4. Lack or loss of trust
5. Lack of community
6. Additions/increases in functions
7. Absence of change
8. Change too rapid

Governance

The Illinois General Assembly in 1985 passed the Illinois Comprehensive Educational Reform Act known as Senate Bill 740 (Appendix E). As part of the initiative of the act, the Illinois Mathematics Science was created as a public, state-funded secondary school for students highly gifted in mathematics and science. In accordance with the legislation,
the governing Board of Trustees is a seventeen member board appointed by the Governor of the State, the Executive Director of the Board of Higher Education, and the State Superintendent of the Illinois Board of Education. The powers of the Board are clearly defined in the legislation. Since the opening of the Academy, subsequent legislation clarified the role and function of the Academy as a separate state agency and granted budgetary authority to the Board of Higher Education. This change in governance, coupled with the changes in administrative structure at the Academy, served as the basis for response of the participants in reference to the category of governance. As a result of analysis of the data, the following issues emerged as changes in structure and management with reference to governance:

1. More bureaucratic
2. Autonomy of staff
3. Increased policies and parameters
4. Strategic Planning
5. Reporting and supervision

Funding

As a public, state school, the Academy's primary source of funding is legislatively approved state appropriations. Private funding and outside funding sources were minimal in the early years. Tuition fees and board and room costs are not charged to students. Students paid no fees in the first year, however, in accordance with legislation, minimal fees of approximately $600 were assessed in subsequent years. The first two years of operation at the Academy were turbulent with reference to funding. Both the level and stability of
funding from annual state appropriations were in a constant state of turmoil and flux. As a result, the perceptions of participants reflected the history of funding as well changes in management and structure. The specific issues that emerged with reference to funding included:

1. Stability
2. Level and amount
3. Support for travel and professional growth
4. Anticipated reductions and tightening of funds
5. Loss of control

**Curriculum**

The class of 210 students in the fall of 1986 participated in twenty-three course offerings in a structured curricular program. As second year students in the fall of 1987, the charter class saw opportunities for limited electives. As the charter class reached the final year, the curricular offerings were more diverse with opportunities for individual selection of many electives in each of the disciplines (Appendix F). As the charter class witnessed the evolution of the academic program, the incoming classes in the same years witnessed the effects of curricular revisions as well changes in graduation requirements. Course offerings in the first year totalled twenty-three, the second year they totalled fifty-three, in the third year they totalled one hundred and one, and in the fourth year they totalled one hundred and eight. With reference to the category of curriculum, data analysis revealed the following issues:
1. Revision of graduation requirements
2. Revision of the class schedule
3. Team focus in curriculum development
4. Summer Programs
5. Revisions in the science curriculum
6. Autonomy and time for development
7. Failure to develop interdisciplinary courses
8. Failure to publish or disseminate curricular models

Leadership

Within the context of organizational changes in management and structure, participants were prompted to respond to changes in leadership. The responses were broad with reference both to positions of leadership and individuals in what was perceived to be leadership roles. Participants identified the following issues with reference to leadership:

1. Addition of people or positions
2. Team leader role
3. Personal encouragement and support
4. The style of the Director
5. Faculty use in leadership
6. Strategic Planning

Decision Making

Participants were asked to respond to changes in decision making. The responses were less varied than in other categories with only three issues emerging as follows:

1. Less input
2. More input
3. Order, clarity, and structure
Other Issues of Change

The fourth and last question of the interview requested that participants inform the researcher of other questions that should have been asked in reference to changes in structure and management and the effect of these on professional growth and development. It was in this area that other interesting and informative issues emerged. The comments made did not address the concept of change at the Academy as much as they addressed the concept of change from other environments or organizations. Although diverse comments were made, several issues consistently emerged as follows:

1. The physical building
2. Demands of time and high expectations
3. Meaningful work and contributions
4. Intensity of the environment
5. The students
6. Sharing with colleagues

Data Analysis

As anticipated, the interview protocol and probes generated data that were qualitative in nature. The transcript of each interview was read and analyzed by the researcher within the context of the eight (8) probes in the interview protocol. The candid and thoughtful responses of the participants yielded valuable data for the study. In an effort to categorize responses, the researcher coded the transcriptions of the interviews in relation to the eight (8) categorical probes of perceived change. As the researcher proceeded through this process of data analysis, it became
obvious that participants were sharing both positive and negative perceptions, often in response to the same area of change. This observation, early in the data analysis process, resulted in the researcher's decision to analyze the data within the framework of positive and negative responses. Perceptions that were judged to be neutral were not included with other perceptions deemed positive or negative by the researcher during the data analysis process.

Within each of the eight (8) probing areas of change, the comments were analyzed as to positive and negative responses of the participants within the framework of perceptions of the effect on (1) the Academy as an organization (place), (2) the participant as member of the organization (self), and (3) the participants colleagues as members of the organization (others). Following initial analysis in this format, the data were recorded on charts, as shown in Figure 1. Recording the data in this manner resulted in the generation of nine (9) charts in the format of Figure 1. Each participant was assigned an interview code number for purposes of recording the raw data on the charts as shown in Figure 1 to assure anonymity. For each year of the represented three years of hire, three charts detailed the positive and negative perceptions relating to the effect of change on the Academy (place), themselves (self), and their colleagues (others).
Perceptions of change and the effect of change on:

- Place
- Self
- Others

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*Codes for probes
Size SB - Size of Student Body
Size of F/A - Size of Faculty and Administration
Gov. - Governance
Fund. - Funding
Cur. - Curriculum
Leader. - Leadership
Dec. - Decision Making
Other - Other Issues of Change

Figure 1: Protocol for Recording Positive and Negative Responses from Individual Participants
As stated in the preceding section, some issues consistently emerged within each of the eight (8) categorical probes. In an effort to further categorize the perceptions of change, the researcher again coded the recorded comments on the nine charts to determine recurring sub-categories of perceived change. Based on the emergence of the issues within each probe, the data were again analyzed within the framework of positive and negative responses. Using the format of Figure 2, eight tables were generated detailing the responses. In Chapter V, Tables 4 through 11 detail the data in aggregate format by year of hire without reference to the code number of the participant and serve as a better method for reporting the data in a confidential manner.

Once all of the data were coded and recorded, the researcher analyzed the data, within the eight categories and emerging sub-categories of change, by the following elements:

1. Content analysis within and across each of the three areas of inquiry.
2. Content analysis by length of tenure.
3. Comparison of interview data to historical record of events at the Academy.

**Reporting the Data**

The data gathered in this study are reported in Chapter V both in aggregate format of categorical responses (Tables 4 through 11) and in narrative format as a result of content analysis (1) within and across areas of inquiry,
**Figure 2: Format for Recording and Analyzing Positive and Negative Responses of Participants Within Areas of Change**
(2) length of tenure, and (3) comparison of interview data to historical events. Chapter V is a report of the findings of the study in this format.
CHAPTER IV
DESCRIPTION OF THE ACADEMY

This chapter is a description of the Illinois Mathematics and Science Academy. In order to provide the reader with a historical perspective of the Academy, since the creation in 1985, the chapter provides an overview of several components of the Academy. The following is a description of the setting, students, the facility, the funding, personnel, and success factors and assessments.

The Setting

The Illinois Mathematics and Science Academy was created by the Illinois General Assembly in 1986 as part of the Comprehensive Illinois Educational Reform Package, Senate Bill 730 (see Appendix E). Legislative mandate stated that the Academy was created to inspire and challenge young boys and girls gifted in mathematical and scientific ability in a manner which will maximize the use of these talents for the benefit of society. Beyond the mandated mission, the Academy had two primary goals:

... to provide an educational, social, and emotional climate in which students with exceptional aptitude in mathematics and science can develop their intellectual gifts and become committed to the search for humane solutions to our world's problems.
... to serve as a laboratory for the development, testing, and dissemination of innovative techniques in mathematics, science and the humanities which can become a resource for secondary school teachers in Illinois and the nation.

In the first three years of existence, the Academy grew from a student population of 210 entering sophomores in the Fall of 1986 with a faculty of 18 (14.25 F.T.E.), to a full three-year complement of students totalling 493 in the Fall of 1989 and a faculty of 62 (50.25 F.T.E.). A rigorous and challenging curriculum, weighted in mathematics and science with a strong base in the humanities, grew from 23 courses in 1986, to 53 in 1987, to 101 courses in 1988, and to 108 courses in 1989 (Appendix F). As the third specialized, public, residential school for mathematics and science in the country, the Academy struggled through political and economic challenges in the first three years striving to address demands of accountability from a broad-based constituency due to the high visibility. As an entrepreneurial organization, the Academy is unique in the educational community with regards to mission, governance, and structure.

As a young and evolving community that struggled through a turbulent founding and continued existence, the Illinois Mathematics and Science Academy has a story to tell about the people who were attracted to the community, what characteristics they possessed that contributed to the survival of the community, and their personal and professional satisfaction and success. The story of focused and communicated vision has implications for other communities addressing the challenge to improve the educational delivery system. At the time of the proposal, six states had similar
schools operating with several additional states proposing legislation or in the active stages of planning and recruitment of students and personnel.

It is the opinion of the researcher that the most important factor contributing to and impacting assessment of program success is the quality, commitment, and personal satisfaction of the people who comprise the community. The Academy professes to recruit, attract, and retain educators who have a proven track record of exemplary performance, a knowledge of the needs and characteristics of gifted students, experience in curriculum development, a commitment to interdisciplinary learning, evidence of innovative and creative approaches to learning, problem finding and problem solving, and a strong base of knowledge in the discipline and field with preferred research experience. Beyond these criteria, recruitment focuses on the nurturing qualities of the individual and the willingness to take risks in innovative and creative endeavors.

If indeed the profile of traits and characteristics of the professional staff at the Academy supports the recruitment and retention goals, the implications for other communities may have significance. If the traits and characteristics are documentable, it would appear that recruitment efforts of faculty as well as students are addressing the reform calls of the eighties that demand heightened accountability for educational systems. Such efforts may have an effect upon educational communities as they move from traditionally conservative and static institutions to innovative, creative and dynamic educational institutions that the reform calls demand.
Students

In the Fall of 1986, the first class of 210 students entered the Academy to begin a three year educational experience. Entering students must have completed the academic equivalency of ninth grade. The students are selected based on their past academic performance, recommendations from school principals, counselors, mathematics and science teachers, and scores on the SAT test. In accordance with legislative mandate, the class was also representative of the diverse demographics of the State of Illinois with reference to sexual, geographic, and ethnic representation (Appendix G).

In the following three years, and in accordance with the same standards for admission, a second, third, and fourth class were admitted totalling 197, 160, and 189 respectively. On June 10, 1989, the Academy graduated the charter class with 168 students participating in the ceremony.

Beyond the clear statistical description, there is a larger and more revealing story about these early years and the students who came to the Academy. In the first year, students accepted invitations to attend a school with no history of performance or accomplishments. In the six month planning period preceding the September 7, 1986 opening, four consultants, two secretaries, and members of the Board of Trustees developed and implemented the entire process of admissions, hired the faculty and staff, developed course offerings, and secured initial funding and support. A statewide recruitment effort for students required staff and Board members to travel across the state disseminating information and recruiting for a school that at the time of student application realized no security of funding or
continued existence beyond June 30, 1986. Indeed the Academy slogan "A Pioneering Educational Community" was descriptive of the first group of students and staff.

**The Facility**

The Board of Trustees, appointed in October of 1985 in accordance with legislative mandate (Appendix E), facilitated the selection of the school site in Aurora, Illinois. The selection was based on the availability of a vacant school facility and surrounding land that would accommodate the Academy’s physical needs. The physical plant includes a 330,000 square foot building that was constructed in 1978 to accommodate a middle school and high school. Due to a shift in anticipated population growth in the Fox Valley, the building was occupied in part for four years and then closed. The building sits on a 93 acre lot in a residential section of the suburban community. The building is an open classroom structure that includes 125 academic rooms and 10 modern scientific laboratories, three gymnasiums, a 350-seat auditorium, and a full size competitive indoor swimming pool. The lot could easily accommodate the anticipated building of nine residence halls and a complement of appropriate athletic fields and facilities. The construction of two residence halls and the purchase of the school site from the West Aurora School District #129 was part of the proposed first year capital construction request from the Illinois General Assembly.

Although residence halls were part of the capital construction plans, construction did not begin until August 11, 1986. Due to the delay, students were housed in the academic
building in areas designated by the State Fire Marshall as adaptable for temporary living accommodations until the residence halls were complete. The timeframe for completion was initially set for November of 1986. The reality of the completion was April, 1987. Girls occupied the home economics and music areas in "make-shift" dormitory sleeping rooms with adapted study and social areas while the boys occupied six science laboratories in the middle school section. A central cafeteria served three meals daily and segregated shower and bathroom facilities were located in the locker room areas. Each group of 22-24 students were supervised by a live-in residential counselor who occupied the same, less than optimal quarters.

The residence halls under construction were designed under the direction of the Board of Trustees to accommodate the young population. Each building houses 92-96 students with each wing housing of 22-24 students. Each room, housing two students, has an individual three quarter bathroom, moveable oak bunk beds, desks, wardrobes, and computer tables. A central lounge facilitates social activities with each wing having a kitchenette and study areas. The dorms are secured with a state-of-the-art, card-key security system programmed by wing and building through a central computer system. The safety, security, and privacy of the students is a high priority as they spend three years in this learning-living environment.

Research data secured in the first year through student and parent questionnaires (School Administrator Service Associates, 1986-1987) revealed that the students living in the academic building the first year felt that the experience was a critical bonding mechanism for them as a class. Although they were uncomfortable and frustrated with the
accommodations and the repeated delay of building completion, they attributed the low first year attrition factor in part to the living experience. At the request of the first graduating class, they spent a final night in the academic building the week before their graduation. It was viewed as a rather nostalgic event with the students still recommending that all entering first year students should be required to live in the academic building as a type of initiation ceremony. This recommendation is no longer a possibility due to the extensive remodeling and expanded building use necessary to accommodate the classroom and laboratory requirements of the academic program.

The Funding

In accordance with the enabling legislation (Appendix E), the Academy is funded through General Revenue Funds as appropriated annually by the Illinois General Assembly. Although minimal student fees can be assessed, students attend free of tuition, board and room. In cases of need, student fees are waived in part or full. Although student fees were not assessed in the first year, in each year thereafter students were asked to pay an annual fee between $500-600 in accordance with fees that would normally be assessed in their home districts, i.e. book rental, co-curricular participation, student activities, and laboratory fees. The fees include a refundable room damage deposit.

In the first two years the Academy funds were appropriated as a grant through the Illinois State Department of Education. After the second year, amended legislation granted budgetary authority to the State Board of Higher
Education. Funding in the first two years was a frustration for the Board of Trustees and a resulting hardship on the Academy staff and academic program.

In the first year, the Board of Trustees requested $6.2 million in operating funds to implement the rigorous academic program and residential component, hire all personnel, and purchase of equipment and supplies. The General Assembly appropriated $3.5 million for the Academy in late June of 1986. Although few permanent staff were hired by this time, the 210 students were invited and many had accepted the invitation. To accommodate the needs of the incoming class, the personnel costs were cut and the faculty to be hired realized a larger student ratio than was first anticipated. In addition, cuts were required in equipment, supplies, transportation, travel, and contractual services. The most significant cut was realized in the area of "Outreach," or what was commonly referred to as the second legislatively mandated mission. The Board of Trustees recognized that the reduced level of funding would not accommodate implementation of the academic and residential program at the Academy and the mandated state-wide Outreach mission, therefore, the Outreach mission realized delayed development and implementation early in the Academy's history. Fortunately, the capital construction requests of the Academy were granted and the funds for the first two residential halls and some building renovation were released.

In the second year, the Academy requested $6.9 million in operating funds to accommodate a student population of 380. Again, funding was uncertain until late June of 1987. Again, the incoming second class was by this time invited to attend and staff were hired for the Fall of 1987. It was at this time that the General Assembly froze the level of funding for all
state agencies at the level appropriated in the previous fiscal year. The action could not allow for any student growth for the Academy. The Academy Board indeed realized a dilemma, for the capital construction appropriation was already facilitating construction of three additional residential halls as part of the initial design to build nine residential halls to realize full anticipated growth. It was at this time that the Board, supported by the parents and staff, decided to open in the fall of 1987 with the total student population of 380, seek a supplemental appropriation in the November Special Session of the General Assembly, and if the appropriation was not realized, close in January of 1988. The action was viewed as bold by some, courageous by others, and arrogant by still others. The Board felt they could not retract the invitations made to students nor the commitments to staff. They further felt that it was important to maintain the growth trend of the Academy and occupy the residential halls under construction.

Once again the students and staff that came to the Academy did so under tremendous uncertainty and little security. The months that followed the decision were filled with activities directed at seeking and securing the supplemental appropriation of $3.4 million. What resulted was a grass roots effort involving all Academy constituencies as a majority of their creative energy focused on the critical task at hand. Students participated in the effort as the entire Academy descended on the State Capitol of Springfield for a day of lobbying. Students and staff set up computer and laboratory simulations in the rotunda of the Capitol and called representatives from the House and Senate chambers to talk with them and hear the Academy's appeal for their support. In November of 1987, as the legislative session drew to a close,
the Academy was granted a supplemental appropriation of $3.2 million and the doors were kept open through June of 1988.

In June of 1988 and again in June of 1989, the Academy received the full operating budget request. Although the capital construction requests were also received, they were not released in full and continued residence hall construction was delayed for one year with the student population frozen at approximately 500 for a two-year period. Two of the additional four residence halls appropriated began construction in the fall of 1989 and the Academy looked to an increased enrollment for the fall of 1990 in a continued growth pattern toward the anticipated 800-900 student population.

Personnel

The faculty, administration, residential counselors, and support/leadership personnel bring to the Academy a diversity in talents, background, and experiences. In the first year, they were attracted to a virtually non-existent institution and in the second year to an institution with uncertain continued existence. In the following years, the memory of uncertainty tended to remain as a perception in recruiting the staff.

Each year the call for applications for faculty, administration, and support/leadership personnel echoed the standards and expectations of the first year as outlined by the Board of Trustees:

1. A minimum of a masters degree is expected
2. An exemplary record of performance is required
3. An understanding of gifted and talented youth is expected
4. A commitment to innovation, experimentation, and exploration is required
5. A nurturing and caring disposition and character is required

Residential counselors are required to hold a minimum of a bachelors degree in education, social work, psychology, or a related field with experience in the care of youth with preference for residential experience. The Academy differs from a traditional boarding school where faculty "live-in" and facilitate the residential supervision of students as well as the academic guidance.

All professional staff came to the Academy on a one-year contract that is subject to renewal each year. There is no tenure. A recently adopted professional development plan, CADRE, will allow for eligibility for two year contracts after three years of teaching. The average student to teacher ratio in the first year was 105 to 1: In the following years, the ratio was gradually reduced to 75-80 to 1. Full-time faculty members teach four classes, spend at least one evening a week on campus in tutorials, participate in leadership roles in co-curricular activities, contribute to the Outreach mission, and independently or collectively develop and field test curriculum models in their specific area of expertise. Their instructional talents and pedagogical skills are directed toward the central mission of the Academy in the facilitation of "apprentice investigation."

Although the curricular program is heavily based in mathematics and science education, the Academy offers a full component of humanities and fine arts courses. The fine arts component was added in the second and third years while the
humanities realized a full range of offerings with an interdisciplinary focus from the opening of the Academy. Students choose from six languages that offer immersion and broad cultural experiences for students. Appendix F outlines the course offerings of the first four years.

Nearly 25% of the faculty hold a Ph.D. and the average years of teaching experience is approximately 12 years. Approximately 60% of the faculty were recruited from high school environments, 5% from business and industry, 22% from higher education, and the remainder with a combined secondary and post secondary background. Although teacher certification is not required, it is preferred. While the faculty is predominantly male, the administration is predominantly female. Appendix H reflects the personnel demographics for the first four years.

The support/leadership personnel are a diverse group who are responsible for support of the academic, residential, and institutional programs. The category includes admissions counselors, career and college development counselors, computer and systems analyst technicians and specialists, social workers, the co-curricular and athletic coordinator, the librarians, the researcher, and the Outreach staff. The credentials and experiences of these individuals is diverse as their roles and responsibilities.

The administration grew from a total of seven in the first year to 11 by the fourth year. The Academy Director was hired in July of 1986 to replace the interim 6-month Director. She brought to the Academy skills and experience in school administration, having served as an Assistant Superintendent for Curriculum and as the only female Superintendent of Schools in Illinois at the time she served. She also brought the vision of the Board of Trustees. She was part of the initial
Curriculum Design Workshop that met in 1983 and developed the proposal for the Illinois Mathematics and Science Academy and served as a charter Board member during the planning period.

Success Factors and Assessments

In the first three years of existence, considerable data and traditional measures of success in the educational arena documented the success of the Academy program and the students. The SAT scores of entering students consistently reveals scores in mathematics and verbal aptitude 100-200 points above the national average in each category respectively for college-bound seniors. As the students progressed through the rigorous academic program, the profile of the first graduating class in June of 1989 revealed a composite SAT score 413 points higher than the national average for college-bound seniors. The graduating class profile also revealed the highest ACT score in the nation with 29.5, 10.9 points above the national average.

College admission statistics were impressive for the first graduating class. Nearly 98% of the class accepted invitations to attend institutions of higher education, with 2% deferring enrollment until the following year. Statistics reveal that 51% of the graduates chose to attend institutions of higher education in the State of Illinois and 60% of the graduates entered with declared majors in mathematics, science, or a technology field of study. These factors are viewed as additional success factors to the people of the State of Illinois indicating that the initial investment in the Academy and the students was beginning to return the
dividends to State by increasing the pool of college graduates with skills and expertise in mathematics, science, and technology.
CHAPTER V

FINDINGS

The problem of this study was to examine the perceptions of selected faculty and administrators at the Illinois Mathematics and Science Academy about changes in the Academy's management and organizational structures and the impact those changes had on (1) the organization, (2) on them as individual organizational participants, and (3) on their colleagues. The interview protocol (Appendix C) contained questions that focused on the concept of change with the following eight (8) areas of change in management and structure given as prompts for participant response:

A. Size of the student body
B. Size of the faculty and administration
C. Governance
D. Funding
E. Curriculum
F. Leadership
G. Decision Making
H. Other issues of change

As a result of analysis of the interview transcripts, additional sub-categories of change emerged from the participant responses. The paradoxical nature of the responses led to the analysis of of the data in a positive and negative context within the framework of the analysis of data by:

1. Content analysis within and across the three areas of inquiry.
2. Content analysis by length of tenure.
3. Comparison of interview data to historical record of events at the Academy.

Analysis of the data within this framework led to the generation of eight (8) tables of data, one for each area of change, with the emerging sub-categories of change detailing participant responses. As noted in Chapter III, participants responded only to areas in which they perceived change.

This chapter presents the findings of the study based on the analysis of the perceptions of change and the effect of change shared by the participants. Aggregated comments of the participants specific to the eight (8) categories of change, as well as the subsequent sub-categories that emerged as a result of analysis of the participant interviews are presented in tables. A narrative analysis accompanies each table.

**Size of the Student Body**

Participants were asked to share their perceptions of change and the effect of change relating to the size of the student body. Although not all participants shared perceptions, the following is a narrative analysis of the content of their responses (1) within and across the areas of inquiry, (2) by their length of tenure, and (3) in comparison to the historical record of events at the Academy.
Content Analysis Within and Across the Areas of Inquiry

Participants viewed the changes in the size of the student body as having more impact on the Academy as an organization than on themselves as organizational participants or their colleagues. Table 4 reflects the aggregate of positive and negative perceptions that dealt directly with the size of the student body with a balance of negative and positive perceptions with reference to the organization and the effect on their colleagues and positive impact on them as organizational participants.

The greatest impact was noted in the changes in:

1. **Formation of policy and rules:** Positive comments reflected a need to establish rules and regulations for order and consistency, while negative comments acknowledged the need, yet perceived the imposition of policy and regulations as reactionary and typical of traditional school systems. There appeared to be a sense of loss of freedom due to the rapid growth of the student body and yet an acknowledgement that growth required order. Although only one participant perceived an impact on their colleagues, it is interesting to note the comment that the rules and regulations imposed restrictions on one's ability to be creative.

2. **Dynamics/differences between the classes:** Positive comments reflected the perception that the first class was unique and "special" while negative comments reflected that the differences between
Table 4: Analysis of Data Relating to the Size of the Student Body

### Size of the Student Body

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<td><strong>Formation of Policy/Rules</strong></td>
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<td>1st Year *</td>
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<td>2nd Year **</td>
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<td>3rd Year ***</td>
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<td><strong>Dynamics/Differences Between Classes</strong></td>
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<td>3rd Year</td>
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<td><strong>Change in Quality of Students/Behavior</strong></td>
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<td><strong>Increased Options and Choices for Students</strong></td>
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<td><strong>Decision Not to Grow to 900 Students</strong></td>
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<tr>
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</tr>
<tr>
<td><strong>No Change Perceived</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>Aggregated Comments</strong></td>
<td>16</td>
<td>14</td>
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</tbody>
</table>

*n = 8
**n = 8
***n = 8
classes. Perceptions included analogies to stages in the life cycle and sibling rivalry typical of the addition of children to a family.

3. **Loss of intimacy/sense of family: less personal:** This issue received the highest voluntary response with seven of the twenty-four participants commenting. Only one of the six perceived the change as positive stating that even though the there was less intimacy with all students, there was still the same intimacy with the same number of students. Six participants perceived the change as negative with a personal sense of loss of intimacy with all students and less personal contact with all students. The perceptions relating to the impact on colleagues were balanced negatively and positively with growth being a paradoxical issue questioning whether "more is less" or "less is more".

4. **Increased options and choices for students:** As Table 4 indicates, six of the twenty-four participants perceived the growth of the student body as positive with respect to increased curricular and co-curricular options and choices. Likewise, the perceptions of the impact on themselves dealt with their ability to grow professionally in more diverse course options and opportunities for instructional innovation.
Content Analysis by Length of Tenure

Participants were representative of the first three years of faculty and administration at the Academy. As would be expected, the participants who arrived the third year were less reflective on changes in the student body merely because of the fact they witnessed fewer changes. In fact, two of the eight participants hired in the third year saw no change and thus their perceptions of change were non-existent other than through the eyes or "stories" of their colleagues.

1. Formation of Policy/Rules: It is interesting to note that participants hired in the first year perceived the formation of policy and rules more negatively than those hired in the second year who perceived it more positively. It is also interesting to note that those hired in the third year did not respond to the issue.

2. Loss of intimacy/sense of family: less personal: Again, those hired in the first year had a greater sense of loss than those hired in the second year, with those hired in the third year not responding to the sense of loss. Four of the eight first year participants viewed the loss as negative. Again, they used analogies of family and life-cycle as reflections of their sense of loss.

3. Change in the quality of students/behavior: Although only two participants noted the issue, both were negative in their perception. The researcher notes this as interesting due to discussions among the
faculty and students over the four years of operation relating to the perception of students being admitted less qualified than the charter class. The historical analysis addresses this perception.

4. **Increased options and choices for students:** The participant responses were generally positive and balanced in relation to the growth providing more curricular and co-curricular options. Only one perception was negative stating the students had too many options and were unable to make good choices and often became overly committed.

5. **No change perceived:** Two of the eight participants hired in the third year perceived no change and stated that their colleagues perceived no change. The historical data affirms this perception that at this time is unique to those hired in the third year.

**Comparison of Interview Data to Historical Record of Events at the Academy**

Historical events and the process of natural evolution and growth support and clarify many of the perceptions of the participants.

1. **Formation of policy/rules:** When the Academy opened in the fall of 1986, the only policies or rules that existed were those implied by the legislation or established by legal counsel for the purpose of clarifying the legislative mandates. Likewise,
policies and rules regulating student actions were less structured, less specific as to consequences, and without precedence for enforcement. As policy issues arose, policy was developed specifically for the issue, often in a hybrid manner drawing on policy from other organizations and often in what may have been perceived to be a "knee jerk" reaction. There is no doubt that those hired in the first year saw the greatest change and those in the third year saw the least.

2. **Dynamics/differences between classes:** There is no doubt that the charter class and charter staff witnessed a unique environment and relationship in the first year. The Academy opened with a great deal of uncertainty both financially and academically. The fact that the charter class lived in the building for eight months created a unique bond among the members of the class. During the interviews some participants noted that the first class was different and unique. During exit interviews with the members of the class there emerged a perception among the class that they were unique.

Whether the dynamics of the charter group are attributed to arrogance, culture, or circumstances, the perception that there was a difference in dynamics is a reality for those individuals. Each class that entered after the first year has struggled with self identity and acceptance; the analogy of the addition of siblings to a family, regardless of the
"joy" associated with the addition, tends to be one of disequilibrium.

3. **Loss of intimacy/sense of family: less personal:** Students and staff in the first year applied to and were accepted into an organization that was at the time of admission a dream. Until June 30, 1986, when the legislature appropriated operating and capital development funds for FY 87, the Academy existed merely on paper. The bond that formed between the original "pioneers" tended to be one of survival. The fact that students lived in the academic building in make-shift dormitories for eight months with at least one-fourth of the faculty being in the building for tutorials each evening, would in itself create a bond that has a sense of family.

In the second year, students again lived in the academic building, although for a much shorter time frame and with the access of "upper-classmen" in a traditional dormitory setting. The opportunities for bonding, for staff and students, were more diverse than those of the charter class and staff. Although the bond may have been more survival oriented, due to the instability of funding past the first semester, somehow the pioneering fiber of the charter group was tenacious. At times there emerged a sense of resentment of interviewees toward the bonding of the charter group; the perception of a sense of favoritism and trust among faculty and administration of the charter group tends to linger
even among some staff hired in the second year. Again, the analogy to family and arrival of siblings and interactions with the "extended family" exists in perception if not reality.

4. **Change in quality of students/behavior:** Although only two participants cited the perception of a change in the quality and behavior of students, it tends to warrant recognition from a historical perspective. Appendix G notes the demographics of the first four classes. It is obvious from the statistics relating to test scores that the academic quality of the students, even with the difference in size of the applicant pool and entering classes, did not change to a great degree. If there were to be a difference in quality of the classes, it would most likely be reflected in the incoming test scores rather than the other demographics that complete the profile of each class. However, the other demographics of the class that denote gender, race, and geographic distribution also tend to be rather stable.

One participant noted that any perceived changes in behavior of the students, such as increases in the incidents of vandalism or aggressive behavior, tend to be a result of classic growth in families or organizations: The complexity of relationships associated with growth manifests itself in different observable behaviors.
5. **Decision not to grow to 900 students:** As a point of historical reference, the perception of two of the participants is noted as interesting. Although only two individuals cited the decision as a positive change, it is an issue that arose and received community attention as a critical issue and continues to be a concern of some staff at the Academy.

The earliest projections of total size of the student body were 800-900 students. Consistently this was the figure used for projections in staffing, residential hall construction, and program initiatives. Those individuals who entered the first year were aware and accepting of the potential growth. The building that was purchased from the West Aurora School District as the site of the academic building was originally built to supposedly house 2100 students in a traditional middle school and high school setting. Although the building had known acoustical problems due to the open-classroom design, it was believed that the building would easily accommodate the projected student body of 800-900.

As the charter staff began teaching, concerns began to surface regarding the physical space and environment of the building. The initial literature lauded the classrooms without walls and bells. Even though the classes in the first year were wide spread within the 7.5 acre building, environmental conditions of space, noise, heat, light, and
ventilation began to emerge as issues of concern. As students and staff were added, the issues continued to arise. The concern was coupled with the on-going renovation within the building that in part addressed some concerns by providing options for enclosed space, and yet caused frustration due to delays and interference with "prime" classroom space. As a result of concerns raised by a broad spectrum of personnel, an acoustical study was completed to supplement existing data from an earlier study done by the West Aurora District who had witnessed similar concerns. The recommendations of the study called for interior renovations to address and reduce the problem. In conjunction with the study recommendations, a process of collaboration and participatory decision making of the staff and the board, the decision was made to cap enrollment at the population of eight residential halls rather than the original nine.

Due to the concerns raised, and what appeared to be relief on the part of many staff when the decision was made to cap enrollment, it is interesting that only two individuals, and neither from the first year, noted this as an issue.

6. **No change perceived:** Two of the eight participants hired in the third year noted no perceived change in the student body. The third year people entered in the fall of 1988 when the student population was 510. In the fall of 1989 the student population stabilized at 494, the double occupancy capacity of
the five existing dormitories. The perception of no change is thus clearly understandable when a focused and personal perspective is given by the participant.

Size of the Faculty and Administration

Participants were asked to share their perceptions of change and the effect of change relating to the size of the faculty and administration. Although not all participants shared perceptions, the following is a narrative analysis of the content of their responses (1) within and across the areas of inquiry, (2) by their length of tenure, and (3) in comparison to the historical record of events at the Academy.

Content Analysis Within and Across Areas of Inquiry

Table 5 contains a summary of the individual and aggregated responses of the participants with reference to changes in size of the faculty and administration. It is interesting to note that the aggregated positive and negative perceptions are somewhat balanced with reference to impact on individual participants, yet weighted heavily negatively in reference to impact on the Academy as an organization and on colleagues as individual participants. Participants also tended to be more reflective on the issue of change in size of faculty and administration than they were with changes in size of the student body.
## Table 5: Analysis of Data Relating to the Size of the Faculty and Administration

### SIZE OF FACULTY/ADMINISTRATION

<table>
<thead>
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<th>Perceptions</th>
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<td>+</td>
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<td>+</td>
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<tr>
<td>3rd Year</td>
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<td>0</td>
</tr>
<tr>
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<td>+</td>
</tr>
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<tr>
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<td>+</td>
</tr>
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</tr>
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</tr>
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<td>Absence of Change</td>
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<td>-</td>
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</tr>
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</tr>
<tr>
<td>3rd Year</td>
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<td>1</td>
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</table>

Aggregated Comments: 11, 30, 9, 8, 5, 12
1. **Diversity of people:** The general perception relating to the diversity of staff was positive with comments reflecting a welcoming of "fresh blood", new ideas, new talent, and different expertise. Negative comments related to the difficulty in reaching consensus with ideas as people become diverse as well as the fact that new ideas create more responsibilities and attention. Individuals viewed diversity in ideas and people as stimulating and confronting, both of which were perceived as positive.

2. **Family structure of the 1st year:** The perceptions of the participants with regard to this issue emerged from the first and second year staff only as they were the ones who witnessed the change. Perceptions carried with them a nostalgia for the first year and a belief that the intensity of the first year built morale. Again, references to the sense of family emerged, especially to the feelings of an only child. Negative perceptions related to the perceived separation between administration and faculty that existed in the first year.

3. **Loss of intimacy:** Perceptions were most concentrated on the perceived loss of intimacy realized from the rapid growth in size of faculty and administration. With one exception, all of the perceptions were negative. The one perception that viewed the change as positive noted that with the growth in the third year, finally the differences between the first and second year people
disappeared. The negative perceptions noted a sense of loss of closeness, a tendency to isolate, a fragmentation, not knowing everyone, lowered morale, and less visibility and access to leadership.

4. **Lack of communication:** All of the perceptions addressing the issue of lack of communication were negative. Most perceptions dealt with the concept of separation and isolation of people into areas that reduce the opportunities for communication. The reference to areas denotes both physical areas and functional areas. There was a sense that reduced visibility of people affected people being heard and that the opportunities to meet as a community and reach consensus on issues was no longer possible.

5. **Additions and increases in functions:** Although somewhat balanced, the perceptions relating to additions and increases in functions was more negative than positive. There emerged a perception that the administration grew more rapidly than the faculty. There also emerged a sense that new people and new functions "took over" space that faculty needed. It was also interesting to note that there was a perception that "new" people do not contribute as much, that their roles and functions are not clearly defined, and that additions have often been reactionary to issues without problems being clearly defined. Positive comments related to the addition of positions to address the "Outreach" mission, academic programs, philanthropic programs, and pupil personnel services. Participants viewed
additions at the administrative level as positive and negative, in that people were no longer overburdened with too many roles, however, it was now more difficult to know "whom to go to".

Content Analysis by Length of Tenure

Staff hired in the first year expressed the most perceptions of change and staff hired in the third year expressed the least. This is to be expected as the first year people witnessed the most dramatic changes in growth and the third year witnessed the greatest stability (Table 3).

1. Diversity of people: Three of the eight participants hired in the first year perceived the increases as positive with the entry of "new blood", new ideas, new talent, and new expertise. One participant perceived it negatively due to increased responsibilities that come with new and diverse ideas. Participants hired in the second year perceived the diversity of people and ideas as personally enriching to them with the negative perception noting the difficulty to come to consensus when diversity exists. Participants hired in the third year expressed no comments.

2. Family structure of the first year: Participants hired in the first year held only positive perceptions of the first year, those hired in the second year had an equal balance of positive and negative perceptions, and those hired in the third year had no
comments. Perceptions of those hired in the first year reflect a nostalgic feeling regarding the intimacy and sense of family of the first year. Participants hired in the second year have positive perceptions of what happened in the first year but in a more pragmatic sense; a feeling that the initial start-up required and facilitated a sense of family. However, the negative perceptions reflect a resentment of the current separation of faculty and administration that was perceived as non-existent the first year.

3. **Loss of intimacy:** Again, the staff hired in the first year were the most expressive to the issue of loss of intimacy with those hired in the third year were the least expressive. Again there was a repeated reference to the loss of family. Other comments related to isolation, avoidance of problems, and a general sense of loss in not knowing everyone. Second year comments focused more narrowly on not knowing everyone and the perception that more people created more meetings. Participants hired in the third year held the positive perception that with growth the differences between years of hire disappeared and the negative perception that there was less visibility and access to the leadership.

4. **Lack of communication:** Perceptions of all years of hire were balanced in numbers and negative in nature. All perceptions noted that with growth the opportunities and avenues for communication are reduced.
5. **Additions/increases in functions:** The participants hired in the first year viewed additions as positive as they better defined roles and functions, yet negative with the perception that too often additions were a "knee-jerk" reaction. Participants hired in the second year viewed positively the additions to "Outreach" and academic programs and held the negative perception that administration was too heavy and additions took space from faculty. Participants hired in the third year were more expressive of perceptions of change as it affected the addition or increases of functions. As with second year participants, they viewed positively the additions to the "Outreach," academic program, and philanthropic programs. They also perceived negatively the additions of administrators. They also reflected negative perceptions relating to the loss of autonomy in teams when more people were added and the creation of compartmentalization and small bureaucracies.

6. **Change too rapid:** It is interesting to note that although only four negative perceptions relating to rapid change emerged from the interviews, they were expressed by participants hired in the second and third years. As noted in Table 3, the most dramatic growth happened in the second year and was witnessed by the participants hired in the first year. Yet no comments emerged from this group of staff.
Comparison of Interview Data to Historical Record of Events at the Academy

Table 3 best reflects the growth in numbers of personnel over the first four years of operation. The growth in each year is reflective of personnel needs to accommodate a growing student population, expansion of existing programs, or initiatives for new programs. Some specific historical events impacted the growth and may have correlation to the perceptions expressed by the participants.

1. **Diversity of people:** In the first year of operation, the projected staffing for the academic program included the equivalency of three full-time instructors for each of the six academic disciplines and two instructors for physical education. This would have facilitated a pupil teacher ratio of 70:1 and an average class size of less than 20. When the funding request was reduced, staff projections were reduced and two instructors for each discipline were hired with one instructor for physical education and part-time instructors to pick up the overload in foreign language. The faculty totalled 14.25 full time equivalencies with instructors having a 105:1 student teacher ratio and average class sizes of 22 to 27 in most cases.

Faculty hired in the first year had a teaching assignment of four classes with the preparation time used for curriculum development and Outreach activities. The interview participants hired in the first year speak nostalgically about the intensity of
the first year and yet all recall the extreme demands of students and the environment. It is not surprising that they perceived positively the addition of personnel that reduced the student teacher ratio and brought with them "fresh blood."

2. **Family structure of the first year:** The living conditions of the students, the uncertainty of funding, the high intensity of the initial start-up year, and the lack of policy, rules and parameters may have contributed to a rather self sufficient community that functioned much as a family. A total staff of less than 50 were more closely tied to a common cause and took pride in being called "pioneers". The family structure and concept within small communities is supported by the classic cultural study of Redfield (1967). When the staff more than doubled in the second year, the sense of loss of family was real to the first year staff. Again, the analogy to family and the addition of siblings reflects the perceptions and feelings of the staff.

3. **Loss of intimacy:** Closely tied to the concept of family is the perceived loss of intimacy that came with the dramatic growth of the second and third years. The ability of the staff to assimilate into the culture and the community a large number of new people tended to fragment attention to individuals. The faculty realized the greatest increase in numbers when after the first year the faculty grew from 14.25 full-time equivalencies to 35.75 full-
time equivalencies. It is far more difficult to be intimate with colleagues when the numbers increase so dramatically. Participants expressed frustration and disappointment in the fact that they no longer knew everyone and perceived this as a personal and professional loss.

4. **Lack of communication:** The processes of communication in a small community are less defined and often ill-structured. As the size of a community or organization grows, the avenues and methods of communication, by necessity, become more structured and well defined. Thus communication often becomes less personal as structures define communication processes. It simply becomes more difficult and cumbersome to communicate with more people serving in more functions. As the Academy became more complex, so did the avenues of communication.

5. **Additions and increases in functions:** In the first year the Academy operated without a Principal, therefore the functions associated with the role of a Principal were divided among the other administrative staff. The role of the Director of the Information Resource System was filled part-time by an social science instructor in the first year. Following the addition of the Principal and the Director of Information Systems in the second year was the addition of the Director of Academic Programs in the third year. In the fourth year the Director of the IMSA Fund (currently known as the...
Director of Institutional Advancement) and the Director of Outreach (currently known as the Director of the IMSAlliance) were added. Each of these were administrative positions that increased the administrative staff from seven in the first year to eleven by the fourth year. These additions grew out of programmatic need with the Principal and Director of Academic Programs also addressing the needs of a growing student population.

The personnel category known as Support/Leadership is a highly diverse group of professionals fulfilling responsibilities relating to academic and institutional support. It is in this category that the greatest growth was realized outside of the addition of faculty. It is also this group of individuals that some interview participants perceived to be administration. Typically the support/leadership personnel grew out of programmatic needs, yet indirectly they met the needs of a growing population. An area of dramatic increase over the four years occurred in the Information Resource System, a combination of the traditional library and computer/information access systems. As funding, both private and public, increased after the first year, the Information Resource System realized growth in equipment and personnel to address the needs of a growing student population, a highly technical academic program, and the highly interactive information access and retrieval needs of the staff.
6. **Change too rapid:** There is no doubt the changes at the Academy were rapid in all areas and across all functions. It is also obvious that the rapid changes were not always ideally synchronized with the resources necessary to best assure success. The fact that the residential halls in two of the first four years were not ready for occupancy at the time the school opened in the fall could be viewed as moving too rapidly. It is no wonder that perceptions of "knee-jerk" reactions and "crisis management" exist among the interview participants. A number of historical events cited in the research will affirm the notion that change has been rapid; the degree to which one perceives the changes as too rapid tends to be one of individual perception and tolerance of ambiguity and chaos.

**Governance**

Participants were asked to share their perceptions of change and the effect of change relating to governance. Although not all participants shared perceptions, the following is a narrative analysis of the content of their responses (1) within and across the areas of inquiry, (2) by their length of tenure, and (3) in comparison to the historical record of events at the Academy.

Interview participants responded to the issue of governance in a broad perspective expressing perceptions of the role of the governing Board of Trustees, the authority of the Board of Higher Education, the direct supervision and organizational structure of the Academy, and the evolution of
policy and parameters over the four year history of the Academy. As Table 6 indicates, even with this broad perspective, the perceptions focused on five issues.

Table 6: Analysis of Data Relating to Governance

<table>
<thead>
<tr>
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<th>Self</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+</td>
<td>-</td>
<td></td>
<td>+</td>
<td></td>
<td>-</td>
</tr>
<tr>
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Content Analysis Within and Across Areas of Inquiry

Participants' perceptions of the affect of change on the Academy as an organization, with regard to governance, were balanced positively and negatively. Although their perceptions of the affect on themselves or their colleagues as organizational participants was less direct, their perceptions were more positive when they spoke of the affect on themselves and more negative when they spoke of the affect of their colleagues. During the interviews participant responses to the issue of governance were direct and decisive with regard to changes in fiscal procedures and processes. Table 6 details the aggregated perceptions to the issue of governance.

1. **More Bureaucratic:** Participant responses to the issue of a more bureaucratic form of governance were generally negative in nature and viewed as having more affect on the organization than on themselves or their colleagues. Positive perceptions viewed the bureaucratic procedures as giving a sense of order to previously unclear processes. Negative perceptions reflected a fear of more bureaucracy as the Academy continues to grow, a more pyramidal structure of governance, more "red tape" and paperwork, and less flexibility.

2. **Autonomy of staff:** Participant responses focused more on the affect of change on the individual and their colleagues than on the organization. Perceptions were generally more positive than negative and reflected a sense of professional pride.
as a result of autonomy of the individual and the teams in which they worked. Negative comments focused on programmatic issues and decisions by the Board of Trustees in setting program priorities and a sense that their voice in not heard.

3. Increased policies and parameters: Perceptions of the affect of change due to increased policies and parameters were balanced positively and negatively in all areas of inquiry. Positive perceptions reflected a sense of welcomed order and structure that results from the clarity of policies and a sense of frustration in the absence of policies and parameters relating to specific issues. Negative perceptions generally dealt with daily, operational procedures.

4. Strategic planning: Participant perceptions of the affect of the Academy’s recently adopted Strategic Plan focused on the Academy as an organization in a positive manner. Affects of The Plan on the participants and their colleagues were balanced positively and negatively. Positive perceptions reflected a sense of order, clarity, and purpose as a result of the plan while negative perceptions reflected a sense of fear of burden of implementation on individuals and a sense of ill feeling among their colleagues.

5. Reporting and supervision: Perceptions of changes in supervision and reporting focused on internal
structures and management rather than the larger concept of Board governance. Perceptions dealt primarily with the Academy as an organization with more negative perceptions than positive. Positive and negative perceptions were balanced when reflecting on themselves as organizational participants and negatively weighted when referencing the impact on their colleagues. There tended to be a sense of confusion as to reporting and accountability with the perception that changes in supervision and reporting were ongoing and confusing.

Content Analysis by Length of Tenure

A balanced number of interview participants hired in each of the three years shared perceptions relating to governance. There also tended to be a balance in positive and negative perceptions within each year of hiring.

1. More bureaucratic: Participants hired in the first year expressed more negative perceptions than positive when referring to the imposition of bureaucratic procedures that increased the paperwork, slowed the process, and reduced flexibility. Although only three of the eight participants hired in the second year responded, each expressed negative perceptions that related to increased paperwork and slowing of the process, coupled with the draw on time due to more meetings being required. Participants hired in the third year, though generally negative, viewed bureaucracy as a
necessary way of maintaining civilization. Negative comments reflected frustration with cumbersome processes.

2. **Autonomy of staff:** The perceptions of the participants hired in the first year were generally positive and reflected a sense of professional growth as a result of the autonomy they are given. This group of participants were the only ones who commented on the role of the Board of Trustees and viewed their governing role and involvement as diminishing over the three year history. Participants hired in the second year responded to internal structural issues such as support for travel and professional growth opportunities of their choice and specifically the autonomy facilitated by the Director of the Academy. Negative comments reflected on programmatic priorities, specifically the perceived lack of support for the athletic program. Participants hired in the third year spoke to the concept of team autonomy with the negative references relating to the positive side of team autonomy with the negative referencing the lack of decision making authority of the team.

A general positive comment that surfaced was the perception that people were allowed and encouraged to fail.

3. **Increased policies and parameters:** The perceptions of the participants hired in the first year reflected a balance of positive and negative opinions. Generally policies and parameters were viewed as necessary
and clarifying, especially following the first year when the structures and processes were very "loose." Negative comments referred to an increase in administrative functions for everyone as a result of policy development and the frustration with policies that are not yet in place that would simplify or clarify operational procedures. The lack of an effective student attendance policy surfaced as a concern along with the lack of security felt with one year contracts for faculty. Perceptions of those hired in the second year were generally more negative, viewing the policies and parameters as too structured and resulting in the demand for more meetings. Positive comments related to the need for structure and rules as the organization grows. Perceptions of those hired in the third year were equally balanced positively and negatively with a sense of insecurity relating to one year contracts and the continuance of a style of governance if the Director of the Academy were to leave. Positive comments referred to operational functions such as the Sophomore Orientation process, team leader role, and formalization of procedures.

4. **Strategic Planning:** Participants hired in the first year perceived the Academy's Strategic Plan (Appendix I) as positive for the Academy with a negative impact on their colleagues. Positive perceptions focused on the clarification and focus on institutional values and mission that The Plan facilitates. Negative perceptions focused on the belief that not all members of the Academy share in
the belief in the Plan or its contents and that it reduces the “escape routes” for those who are threatened by change. The perceptions of the participants hired in the second year were generally negative noting that The Plan would add to the responsibilities and time demands and that it would continue to be a constant worry to the staff. The perceptions of the participants hired in the third year were all positive with reference to the clarity of focus, program, priorities, and mission. The plan was viewed as a tool to reduce the crisis management that existed in the first three years.

5. **Reporting and supervision:** The perceptions of the participants hired in the first year were all negative in regard to changes in supervision and reporting. There emerged a sense of frustration in changes in supervision as a result of changes each year in the organizational structure. They also expressed confusion in the clarification of priorities for people in their roles and a sense of displacement as the organizational structure grew and changed. Participants hired in the second year were more negative than positive with primary focus on the lack of clarity in the assessment and evaluation process of staff as well as the perceived addition of layers of supervision that resulted with growth. Positive comments referred to the clarity brought about by the changes in the management of the security and maintenance areas as well as the team leader role. Perceptions of those hired in the third
year were more positive than negative and focused on the creation of the team leader role and responsibilities.

Comparison of Interview Data to Historical Record of Events at the Academy

Although the actual governance did not change over the first three years, clarifying legislation brought about the imposition of "State" structures that were perceived as bureaucratic. The enabling legislation (Appendix E) remains as the basis for the formation and operation of the Academy.

More bureaucratic: In the first two years of operation, the Academy operated with a grant from the State Board of Education. Due to lack of clarity of the enabling legislation that created the Academy, in the first two years of operation the Academy functioned as an autonomous, independent agency free from most regulatory procedures of the State of Illinois. At the local level this allowed for a high degree of flexibility in procedures in every function of the Academy, especially the fiscal procedures. The clarification of the Academy as a State Agency also clarified the budgetary authority of the Board of Higher Education with relation to the Academy. This fact impacted the process of budget development, allocation of resources, and reduced flexibility in fiscal procedures. For those hired in the first and second years the change was definitely perceived as negative and imposing.
2. **Autonomy of staff:** The Academy Board of Trustees in the first year functioned as the governing board and yet also served in functional, operational roles in the early stages of operation. "A Dream Becomes Reality" (Appendix J) is an article written in the first six months of planning prior to the Academy's opening that notes the early involvement in function of the board members. Each of the members actively participated on one or more of the original planning committees and individually promoted the Academy as well as assisting with the initial planning activities. The continuance of members on the Board provided continuity of leadership and governance. Likewise, continuity in the membership of the administration contributed to the focus of governance and the promotion of autonomy of staff. From the beginning, the Board and staff were involved in joint efforts to develop and implement an exemplary program at the Academy. Early literature and advertisements called for "educational entrepreneurs" to teach and guide "apprentice investigators". The literature encouraged innovation, interdisciplinary approaches, and risk taking. The autonomy of staff was assured in program and curriculum development within the context of the mission, goals, and purposes stated in the legislation.

3. **Increased policies and parameters:** In the absence of formal policy the first year, traditions often established and regulated the responsibilities and behavior of the members of the community. Many
members speak of the crisis management that guided many decisions and a reference to "management by swarm" is often made in reference to decisions and standard operating procedures. As the Academy grew, and as issues and problems were confronted, policies and parameters emerged in the form of formal Board policy or building operating procedures that both clarified and ordered many of the activities and functions of the Academy and the members of the community. Policies and procedures emerged from internal demands as well as external demands. There is no doubt that the perception of an increase of policies and parameters over the first three years was a reality.

4. Strategic Planning: In the Spring of 1989, the Academy began the process of strategic planning with the facilitation of an outside firm specializing in development of plans for educational systems. A committee of twenty five individuals, representing all areas of the Academy, including the Board of Trustees and parents of students, began the process. The process continued through the following year with the active involvement of a large percentage of the entire community. The resulting plan (Appendix I) clarifies the mission, beliefs, strategic policies, and strategies that will guide the Academy in the coming five years. The Plan is called "revolutionary" and impacts greatly the teaching faculty as well as all components of the Academy community. As a Board adopted plan, it provides the focus for program initiatives and the future of the Academy.
5. **Reporting and supervision:** As Table 3 indicates, the growth of the Academy personnel was most dramatic in the second year of operation, although each year witnessed growth and expansion. The organizational chart that depicts the supervision and reporting of Academy members was virtually in draft form throughout the first three years. In the fourth year the Strategic Plan included a strategy that addressed the issue of effective and efficient organizational structure. With the addition of functions, as well as the expansion of functions, the issue of reporting and supervision was one of transition and revision. Because the organizational chart is still in draft form there is a perceived confusion in clarity of role, reporting, and supervision. Coupled with the confusion of the process of supervision is the fact that assessment procedures and instruments were also subject to revision. As noted by some faculty members, the emergence of the CADRE (Career Development Rewarding Excellence) document clarified for faculty the process, intent, and goals of faculty assessment. The document was Board approved in April of 1990, three and one-half years after the Academy opened.

### Funding

Participants were asked to share their perceptions of change and the effect of change relating to funding. Although not all participants shared perceptions, the following is a
narrative analysis of the content of their responses (1) within and across the areas of inquiry, (2) by their length of tenure, and (3) in comparison to the historical record of events at the Academy.

Interview participants shared perceptions relating to changes in funding in a less reflective and more "matter-of-fact" fashion. It appeared that the issue was one of the areas in which change was witnessed, that it impacted them personally and professionally, yet their perceptions were less introspective. Table 7 depicts the aggregated responses.

Content Analysis Within and Across Areas of Inquiry

Perceptions relating to the effect of changes in funding focused on the Academy as an organization and the individual as an organizational participant. Participants were less reflective of the effect on their colleagues.

1. Stability: All perceptions across all areas of inquiry were positive in reference to the stability of funding. Overwhelmingly there was a sense of relief that the funding authority and level seemed to have reached a level of stability.

2. Level and amount: Participants were most reflective of how the changes in the level of funding affected them as organizational participants, with specific reference to the availability of resources. Again, with one exception all perceptions were positive.
### Table 7: Analysis of Data Relating to Funding

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3. **Support for travel and professional growth:** Again, as would be expected, the participants shared perceptions of how changes affected them as members of the community. All comments were positive.

4. **Anticipated reductions and tightening:** The perceptions of anticipated changes to come in the form of reductions in funding was perceived negatively and balanced as to the effect on the Academy, themselves, or their colleagues.

5. **Loss of control:** The effect of change in the control of the funding process focused on the Academy as an organization. All of the perceptions were negative.

**Content Analysis by Length of Tenure**

In general, participants hired in the first year shared more perceptions than those hired in the second year with the fewest perceptions of effect of the changes expressed by the participants hired in the third year.

1. **Stability:** The perceptions of the participants hired in the first and second year focused on the change in stability from the first two years. Comments reflected a sense of common purpose as a result of the struggles of the first two years, and a sense of relief that the funding was now stable. One comment referred to the “sanity” of those who experienced the first year. Participants hired in the third year
shared perceptions of the effect of the change in funding noting that funding had been stable since their arrival.

2. **Level and amount:** Participants hired in the first year shared more perceptions than those hired in the subsequent two years. All perceptions were positive with one exception, where the perception was that the limited funding under the Board of Higher Education would restrict the Academy's ability to attract the best faculty. Most positive comments referred to the "wonderful" and "plush" resources. Perceptions of those hired in the second and third years were all positive noting the most important things provided as a result of level of funding to be the Instructional Program Aides, the computer resources, and supplemental pay for curriculum development.

3. **Support for travel and professional growth:** Although participants hired in the first year were more reflective than others, all participants perceived the support for travel and professional growth very positively. One participant called the support the faculty's "water supply."

4. **Anticipated reductions and tightening:** A balanced number of participants hired in each of the three years responded to the issue of anticipated reductions with all perceptions being negative, as would be expected. There tended to be a fear that the history of funding of institutions of higher education
in the State of Illinois was historically below optimum and that placement of the Academy under the budgetary authority of the Board of Higher Education would result in reductions. This perception was coupled with the perception that in the past two years the funding level was optimum and the pattern was too good to continue.

5. **Loss of control:** None of the participants from the first year of hiring responded to the issue of loss of control. Participants of the second and third years responded negatively referencing a perceived loss of freedom, flexibility, and knowledge of budget allocations.

**Comparison of Interview Data to Historical Record of Events at the Academy**

Stories about the turbulent beginnings of the Academy usually reference the instability of funding and the level of funding. Even participants who were not a part of the community reflect on the early issues. Historically speaking, the perceptions of the participants are documentable in most cases.

1. **Stability and level of funding:** In the six months prior to the opening on September 7, 1986, the Academy had a $500,000 grant for planning. In that time frame, an interim Director, four consultants, two secretaries, and members of the Board of Trustees facilitated the opening of the Academy in
the fall of 1986. The procedures for the admission of the first class were developed and implemented and part of the staff were hired prior to July 1, 1986. It is interesting to note that although members of the Board of Trustees Finance Committee were actively involved in securing the funding for the first year of operation, and were working closely with key legislators, the funding was not known until June 30, 1986. Of the $6.2 million requested for operating the first year, $3.5 million was allocated. It was at this point that some programmatic and staffing reductions were made to assure the Academy's opening in September.

In the second year, the process for requesting the operating funds followed much the same process with the Academy administration and members of the Board of Trustees again working with key legislators to assure an appropriate level of funding to accommodate the entrance of the second class. It was at this time that the funding for all State agencies was frozen at the level of the previous year and the Academy received $3.5 million of the requested $6.9 million on June 30, 1987. The second class was admitted, the staff was hired, and the Academy had half of the needed monies to continue in the second year. The Board of Trustees decided to open in the fall of 1987 with a full student body and staff and to channel all their efforts toward securing supplemental funding the the Fall Legislative Session and close in January of 1988 if the efforts failed. The decision was thought to be
bold by some and arrogant by others. The result of the concentrated lobbying efforts across the state resulted in the allocation of an additional $3.2 million in November of 1987, and the Academy remained open through the second year.

In the third year, clarifying legislation shifted the funding of the Academy from a grant through the State Board of Education to the Board of Higher Education. As a result, funding became more stable but subject to Board of Higher Education guidelines. Many members of the Academy perceive that flexibility and level of funding may have been "traded" for the stability of funding. The history then of stability of funding and level of funding does support the perceptions of the interview participants.

2. **Support for travel and professional growth:** In the first and second year of operation, all full-time faculty members were allocated $500 for professional travel and development and unlimited, approved professional leave. In the third and fourth year, each member received $650 and team leaders and team coordinators received $1000. In addition, the Director of the Academy approved additional travel monies to individuals when the request supported the programmatic priorities of the Academy and supported the mission and goals of the Academy. Part-time faculty receive pro-rated allowances equivalent to their teaching load.
3. **Anticipated reductions and tightening:** Many of the members of the Academy staff come from backgrounds in higher education. They acknowledge that they carry with them negative memories of the history of the funding of institutions of higher education. Because the Academy is a secondary school, under the budgetary authority of the Board of Higher Education, it is often caught in the middle when comparability standards of funding are established. The competitive cohort group for the recruitment of faculty is most typically the secondary "lighthouse" districts in Illinois with a higher per student cost and higher average teaching salaries. It is a difficult arena in which to compete and attract exemplary faculty if funding levels are not adequate to support the resources, human and material, needed to assure program implementation and fulfillment of the mission. At this time, the perceptions are premature, as the level of funding has not been significantly impacted by budgetary cuts.

4. **Loss of control:** The process for internal budget development has changed each year of operation. The timelines, methods of development, and categories for development each changed as the budgetary authority changed. Change, in the budget development process, could easily be perceived as loss of control when coupled with the restructuring of supervision and reporting and the rapid growth of personnel.
Participants were asked to share their perceptions of change and the effect of change relating to the curriculum. Although not all participants shared perceptions, the following is a narrative analysis of the content of their responses (1) within and across the areas of inquiry, (2) by their length of tenure, and (3) in comparison to the historical record of events at the Academy.

Table 8 depicts the aggregated perceptions of change in structure and management in curriculum at the Academy. Participants perceived changes affecting curriculum very favorably.

Content Analysis Within and Across Areas of Inquiry

The perceptions of the participants focused on the effects of changes in curriculum on the Academy as an organization and on the interviewees as organizational participants.

1. **Revision of graduation requirements**: The changes in the graduation requirements during the first year were perceived as favorable with an impact seen on the Academy, and although the perception of the effect on students was not an area of inquiry, the participants viewed the effect to be significant for students. Although only two participants responded to the issue, the researcher chose to note the
### Table 8: Analysis of Data Relating to Curriculum

#### Curriculums

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**Aggregated Comments**

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perceptions due to the historical events that dictated the change.

2. **Revision of the class schedule:** Perceptions relating to the effect of the change in class schedule were viewed as impacting the Academy and the participants positively. No one noted effects on the colleagues.

3. **Team focus in curriculum development:** Participants perceived the team focus in curriculum development to have positive effects in all areas of inquiry with the greatest effect noted on the Academy as an organization.

4. **Summer Programs:** Participants perceived changes in summer programs as positive with the effects noted on the Academy as an organization and themselves as organizational participants.

5. **Revision in the science curriculum:** Perceptions relating to the effect of change in the science curriculum are noted in all areas of inquiry with the greatest impact on the Academy as an organization.

6. **Autonomy and time given for development:** The perceptions of participants with regard to autonomy and time given for curriculum development included all areas of inquiry with the greatest impact on the Academy as an organization.
7. **Failure to develop interdisciplinary courses:**
Participant perceptions regarding the failure to develop interdisciplinary courses reflected an effect on the interviewee as an organizational participant with no effect noted on the Academy as an organization or their colleagues.

**Content Analysis by Length of Tenure**

With one exception, the participant perceptions were balanced in response to the issue of the effect of change on the curriculum. The exception is noted below.

1. **Revisions of graduation requirements:** Participants hired in the first year were the only group to perceive the change in graduation requirements. This stands to reason due to the changes being made the first year of operation. The perceptions were positive. The concept of "less is more" was noted by the participants as well as the pass/fail option that was part of the change.

2. **Revision of the class schedule:** The participants hired in the first year perceived the effects of the changes in the class schedule more than the other two years of hire. However, all perceptions were positive. The schedule was viewed as more flexible and adaptable to program needs and perceived to be driven by the curriculum and student needs.
3. **Team focus in curriculum development:** It is interesting to note that the participants hired in the third year perceived the effect of the team focus more than the participants hired in the first or second year. In all cases the perceptions were positive with the greatest impact on the Academy as an organization. Participants hired in the first and second year perceived the team focus as bringing in more interdisciplinary ideas with members having a broad spectrum of expertise. Participants hired in the first year and third years noted the Strategic Plan as positive in assuring team focus in curriculum development.

4. **Summer programs:** Participants hired in the first and second year perceived more change and the effect of change in summer programs than did the participants hired in the third year. Participants hired in the first, second, and third years all noted the programs in Summer Adventures, Afternoon Scholars, and Saturday scholars as positively affecting the Academy as a place and themselves as organizational participants.

5. **Revisions in the science curriculum:** Participants hired in the first and second years perceived the revisions in the science curriculum as having positive and negative effects while those hired in the third year perceived only positive effects. Participants hired in the first year and second year perceived the revisions as necessary and visionary but perceived a lack of and resistance to change in
the area of chemistry. It is interesting to note that one participant perceived the changes in the physics curriculum as being an infringement on academic freedom. Participants hired in the third year perceived only positive effect specific to the changes in the physics curriculum.

6. Autonomy and time given for development: Positive and negative perceptions relating to the issue of autonomy and time were balanced within the years of hiring. Participants hired in all three years perceived very positively the autonomy given to curriculum development and saw their efforts impacting and affecting educational change with opportunities for professional and personal growth noted. The diversity of ideas and the encouragement to be innovative was perceived very positively. Negative comments paradoxically focused on too much innovation and too many ideas. Participants hired in the second and third year perceived the first year curriculum as set and in place and perhaps too autonomous in development.

7. Failure to develop interdisciplinary courses: One respondent from each year of hire perceived a failure to develop interdisciplinary courses as a negative effect on themselves as organizational participants. Each participant expressed personal disappointment in what they had perceived to be a critical dimension of the Academy’s curriculum.
Comparison of Interview Data to Historical Record of Events at the Academy

Historical data supports and clarifies the perceptions of the participants.

1. **Revision of the graduation requirements:** Early promotional literature stated that students would graduate from the Academy and enter university at the sophomore level. Based on this premise, the graduation requirements for the charter class reflected course credit at the Academy that would best assure entrance to university as a sophomore. In the second semester of the first year the faculty and administration collaboratively addressed what they perceived to be too rigorous an academic program and recommended revision of the requirements. The literature subsequently was revised to better reflect the rigor of the academic program but no longer assured entrance to university as a sophomore. The revision also included pass/fail options for a limited number of courses. The revisions were perceived as good for students. Only those hired in the first year would recall the impact of the decision.

2. **Revision of class schedule:** In the first year, the class schedule reflected a traditional nine period, secondary schedule. After the first year, the faculty and administration considered other options for class schedules that would best blend the traditional secondary and traditional college schedule to meet
the needs of the students and the academic program. In the second and third years, innovative ideas such as EX Day and shortened schedule days better accommodated the residential program, the academic needs of second and third year students, and the research opportunities for students and faculty. A six-day schedule that blended the college and secondary schedule was well received by staff and students.

3. Team focus in curriculum development: In the first year, teams of two developed the initial curriculum and in the second year teams of two to five revised and developed new curriculum. From the beginning, the emphasis for team development was a central focus. However, the Strategic Plan better defined the team efforts especially with the focus on a concept-centered curriculum that is discovery based. The development for these strategies, coupled with the attention on student assessment and achievement, require joint team efforts both within disciplines and across disciplines.

4. Summer programs: The enabling legislation creating the Academy called for a second mission that was referred to as the “Outreach” mission in the first three years. The Outreach mission focused on the improvement of mathematics and science education for the State of Illinois with emphasis on curriculum development and dissemination, teacher training, and enrichment programs for students in Illinois who were not Academy students. Due to limited funding
in the first two years, the Outreach mission received less attention than did the primary mission of providing an exemplary educational program in a residential setting for a sample of Illinois most talented young scholars. This delayed effort of attention was a disappointment to the members of the Board of Trustees, the Academy staff, and the members of the General Assembly. In the third and fourth years, the program received more attention and the priority allocation of resources. This effect was perceived very favorably and is reflected in the responses of the interview participants.

5. **Revisions in science curriculum:** The first-year science program was called Integrated Science and was a double course in college physics and chemistry. In the second year, electives and university biology were added and in the third year, expanded electives were added. As the science program grew, attention continued to focus on the sophomore physics program as staff struggled with the content, context, concepts, and delivery of the course to entering sophomores. Research in student learning supported proposed changes and the physics faculty struggled with the proposed revisions. A collaborative effort among the physics faculty resulted in the implementation of the “new sophomore physics” the fourth year. At the time of the interviews, the perceptions were very favorable both from physics participants and participants from other disciplines. The model is currently being used for the revision of sophomore chemistry and will be
6. **Autonomy and time given for development:** In the first year, teacher loads were established at four classes with the other time to be devoted to curriculum development and Outreach activities. This standard remained throughout the coming years. Curriculum development in the first year demanded a great deal of time from the faculty as no curricular models were in place and each faculty member developed their discipline's specific courses. Teams of two collaborated in the first year and in the subsequent years the same team process prevailed. Money for curriculum development is available to faculty through the year and during the summer. The autonomy in development is assured within the context of the Strategic Plan with focus on the Student Learner Outcomes, concept-centered curriculum, and discovery-based learning. Although time continues to be given, the faculty perceive the multiple demands on their time as taking away from time to develop curriculum.

7. **Failure to develop interdisciplinary courses:** The early literature and advertisements called for interdisciplinary experience and approaches to teaching. Although several interdisciplinary courses emerged and were successful, a sense of disappointment prevails among some faculty. Continued efforts toward a concept-centered
curriculum and assessment that focuses on the Student Learner Outcomes will better assure fulfillment of this goal.

Leadership

Participants were asked to share their perceptions of change and the effect of change relating to leadership. Although not all participants shared perceptions, the following is a narrative analysis of the content of their responses (1) within and across the areas of inquiry, (2) by their length of tenure, and (3) in comparison to the historical record of events at the Academy.

Content Analysis Within and Across Areas of Inquiry

Table 9 contains a summary of the participant perceptions relating to changes in leadership. Participant perceptions relating to changes in leadership focused on the Academy as an organization and themselves as organizational participants more than on their colleagues. Perceptions were generally positive when dealing with the Academy and themselves and more balanced positively and negatively where referring to their colleagues.
Table 9: Analysis of Data Relating to Leadership

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<td>Aggregated Comments</td>
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<td>12</td>
<td>29</td>
<td>13</td>
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<td>8</td>
</tr>
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</table>
1. **Addition of people/positions:** It is interesting to note that the perceptions relating to the addition of people or positions were more negative than positive across the areas of inquiry. The perceived negative effect on the organization, the participants, and their colleagues referred to confusion in roles with the addition of people, the feeling that the addition of people did not solve the operational problems such as student attendance, the need for more meetings as a result of more functions, and the isolation caused by team focus with the creation of the team leader role. Positive comments referred to the addition of people to handle functions held by too few people previously. Specific effects cited that benefited the organization was the addition of the Principal and the Director of Academic Programs.

2. **Team leader role:** Perceptions relating to the creation of the team leader role were more positive than negative across all areas of inquiry with the greatest effect reflected on the Academy. Positive comments spoke to the issue of shared leadership at the team level with specific accolades to many of the individuals. Negative comments focused on the perception that the role took away faculty and added administration and that the team leaders were not supported and trained for their roles and therefore did not function as leaders. Perceptions of the affect of the team leader role on individual participants reflected a sense of professional growth in those that held the position and team
autonomy that supported personal and professional growth. Negative and positive comments referred to the process of assessment and evaluation by team leaders.

The perceptions of the effect on colleagues were balanced with negative references to the "loss of peers" and positive references to valuable assessment and evaluation procedures.

3. **Personal Encouragement/support**: The perceptions relating to personal encouragement and support from people in leadership roles focused on the effect on the individual participants in a positive manner. Perceptions referring to the effect on the organization or colleagues were also more positive than negative. References to the effect on the organization relating to the encouragement to take risks, the open and honest level of trust, the challenge and "stretch," and the opportunities to be creative and innovative. Negative comments referred to the tendency of leaders not to make decisions at the lowest level possible and the strategic planning process that was perceived as top-down management. Overwhelmingly, the perceptions that effect the individual participants referred to the style and personality of the Academy Director and her vision and leadership. Negative comments referred to the pace and demands that limited the options for professional growth and the sense of being overwhelmed by the expectations of the leadership. Perceptions dealing with the effect
on others focused negatively on what was perceived to be "the favored few" by the administration and fear that people would not be treated fairly.

4. **The style of the Academy Director**: Perceptions focused more on the effect on the organization and individual participants. Positive comments referred to the Director's collegial and open style, her vision in the Strategic Plan, her political skills, and ability to work through crises. Negative comments referred to her "workaholic" style that relayed unrealistic expectations. There was also a sense of loss and separation from the Director after the first year when she was more visible.

5. **Faculty use in leadership**: The comments in this area were isolated to the effect on individual participants and was more negative than positive. Two participants responded with a sense that they were not being utilized to their full potential. The positive comment made referred to the role of leadership in the Faculty Forum.

6. **Strategic Planning**: Comments here were few and isolated but interesting with the perceived tie to leadership across lines of inquiry. As noted earlier, the Academy's Strategic Plan was cited in the area of governance. Within the context of leadership, perceptions focused on the opportunity to work with the leadership, specifically the Director, and the respect given to community members through the strategic planning process by the leadership.
Content Analysis by Length of Tenure

Participants hired in the first year held more perceptions than those hired in the second and third years and were generally more positive in their perceptions than the other two years of hire.

1. **Addition of people/positions:** Participants hired in the first year welcomed the addition of the Principal, the Director of Academic Programs, the Director of IMSAll and the Researcher. Perceptions focused on the shared responsibilities of leadership brought about by the addition of people. Negative comments referred to the lack of clarity to roles and responsibilities and unrealistic expectations of the leadership. Participants hired in the second year did not respond to the issue and those hired in the third year were more negative in their perceptions relating to the "failure" of the team leader role and the resulting divisions and faulting communication.

2. **Team Leader Role:** Participants hired in the first year and second years responded with a balance of negative and positive perceptions. The context of the perceptions was paradoxical with the same factors noted as positive and negative; the shared leadership, the responsibility of assessment, the autonomy to teams, and the vision provided. Perceptions of the participants hired in the third year were all positive with specific reference made to individual team leaders and their effectiveness.
3. **Personal encouragement/support:** Perceptions of those hired in the first year were far more positive than negative with greater response from participants hired in the second and third years. Positive perceptions focused on the opportunities for innovation, creativity, autonomy, and the professional development opportunities. Negative perceptions focused on the fear of not being treated fairly and the issue of some being viewed as "the favored few." Second year participants viewed positively the opportunities to risk and be creative, the opportunities for travel, and the personal contact with people in leadership roles. Their negative perceptions dealt with the sense of unrealistic expectations of the leadership and the limited time for professional growth because of the expectations. Perceptions of those hired in the third year were all positive with reference to the open and humane environment, the support of human and material resources, and specific references to individuals in leadership roles.

4. **The style of the Academy Director:** The perceptions of the participants hired in the first and third years were all positive and referred to the Director's political skills, her vision, her collegial style, and her role in the Strategic Plan. Those hired in the second year shared similar positive perceptions with negative perceptions focusing on the Director's "workaholic" expectations, the loss of access and visibility to her, and the unrealistic expectations.
5. **Faculty use in leadership:** Participants hired in the first and third years responded to this issue and the responses were limited. The negative perceptions were held by those hired in the first year with a sense that they were not used to their full potential. The positive perceptions of those hired in the third year referred to their role on the Faculty Forum.

6. **Strategic planning:** The only perceptions shared came from participants hired in the third year and were all positive with reference to increased contact with the leadership, especially the Director and the respect given to members of the community during the strategic planning process by the leadership.

**Comparison of Interview Data to Historical Record of Events at the Academy**

Historical events that affected organizational structure with relation to leadership clarify in part the perceptions of the interview participants.

1. **Addition of people/positions:** The addition of the Principal and Director of Information Systems in the second year, the Director of Academic Programs in the third year, and the Directors of Institutional Advancement and the IMSAlliance in the fourth year, were all additions of administrative staff with leadership responsibilities and roles. The addition of the Team Leaders at the close of the second year
provided more leadership roles for the faculty. Beyond this, the addition of other personnel in critical function areas may have been perceived as additional leadership by some participants. As Table 1 indicates, the rapid growth especially in the second year, would trigger perceptions of additional leadership. The fact that participants hired in the second year did not share perceptions relating to the issue may be due to fact that they were part of the greatest change and less perceptive of the effect.

2. **Team Leader Role:** The team leader role evolved in the second year. The expectation for the team leaders was to serve as "key communicators" within the team and across the disciplines. Release time was given for budget preparation, coordination of curriculum development, teacher assessment, and other team and Academy administrative responsibilities. Team leaders apply to and are interviewed by the colleagues in the team. The team recommends their choice to the Principal and Director of Academic Programs who make the final selection. Assessment of the role and the functions each year resulted in some revisions of responsibilities. The issue of teacher assessment and the role of the team leader in the process tends to be one area of confusion subject to faculty criticism.

3. **Personal Encouragement/support:** The Academy mission statement speaks of "A Community of Scholars" with other literature supporting the idea
that staff are encouraged and supported to be "educational entrepreneurs." The Academy literature is supported by processes and practices that support realization of these concepts. Unlimited professional leave, $650 for professional growth, and encouragement to risk and fail are components of the system that supports the faculty. Beyond these factors, the "open-door" policy of the Academy facilitates access and contact to the leadership.

4. **The style of the Academy Director:** The fact that the Director was one of the original members of the Board of Trustees and participated in the original curriculum workshop that proposed the concept of the Academy tends to bring continuity of vision and purpose to the role of the Director. Although the leadership literature was not a part of the Chapter III, the research of Gardner (1990), Bennis and Nanus (1985), and Burns (1978), among others, speaks to the influence of the founder and leader on the organization. The culture literature (Deal, 1986) also speaks to the role of the leader in establishing the culture of a community. All perceptions of any one individual or their style will not be unanimously positive or negative.

5. **Faculty use in leadership:** It is interesting that the negative comments were made by participants hired in the first year. It would seem that they would have the greatest sense of ownership and contribution having been one of the "pioneers." Their perception that they were not used to their full
leadership potential is at the least interesting. Historically, they served in the same roles as faculty throughout their tenure; the issue of no change in role may be a factor here.

6. **Strategic planning:** It is interesting to see that only participants hired in the third year shared perceptions relating to leadership and strategic planning. The perceptions they shared related to the opportunities to work with the leadership and acceptance of their work. Perhaps their length of tenure is the reality of the perception; their exposure to the culture and the community members was simply shorter.

### Decision Making

Participants were asked to share their perceptions of change and the effect of change relating to decision making. Although not all participants shared perceptions, the following is a narrative analysis of the content of their responses (1) within and across the areas of inquiry, (2) by their length of tenure, and (3) in comparison to the historical record of events at the Academy.

Table 10 depicts the aggregated perceptions of the interview participants relating to changes in decision making. The perceptions of the participants were focused toward three basic subgroups and were balanced in negative and positive perceptions of change.
Table 10: Analysis of Data Relating to Decision Making

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<tr>
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<td>More Input</td>
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<td>3</td>
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<tr>
<td>Order, Clarity, Structure</td>
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<tr>
<td>3rd Year</td>
<td>4</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

Aggregated Comments | 15 | 16 | 5 | 3 | 5 | 5 |

Content Analysis Within and Across Areas of Inquiry

Participants shared more perceptions of change as they related to the Academy as an organization than affects on themselves or their colleagues.

1. **Less input:** Participants perceived less input into the decision making process with all perceptions being negative with one exception with the effects most apparent as they impact the organization. They perceived the least affect on themselves.

2. **More input:** Participants perceived more input into the decision making process more positively than
negatively, especially as it impacted themselves and their colleagues.

3. **Order, clarity, structure:** The perceptions of changes in order, clarity, and structure of the decision making process were more negative than positive with the greatest impact on the Academy as an organization.

**Content Analysis by Length of Tenure**

Participants hired in the first and third years shared more perceptions than those hired in the second year with those hired in the third year more positive than the other two years of hire.

1. **Less input:** Participants hired in the first year generally viewed less input as negative with the growth in numbers of staff resulting in fewer people heard and fewer people contributing to decisions. They also expressed a sense of loss from the first year when decisions were made as "a family."

Participants hired in the second year shared perceptions that were all negative with references to decisions made only at the top, lack of autonomy in making decisions at the level most appropriate, and input missing in decisions such as the strategic planning team and the CADRE document. Perceptions of those hired in the third year were negative in this reference and spoke to decisions being top-down.
2. **More input:** Participants from all three years of hiring responded more negatively than positively to the issue of more input. Participants hired in the first and second year shared negative perceptions that the process is slowed with too much input and issues are revisited too often with too many people "swarming" around the decision never knowing who will finally decide. Positive comments from all years of hire referred to opportunities to input that they had never had before, to opportunity to have input on admission of students and hiring of new staff, the benefit of team and student input, and the autonomy in decision making in the classroom and in the team.

3. **Order, clarity, and structure:** Participants hired in the first year perceived very little clarity in the process and expressed a perception that no one knows what participatory decision making means. They also expressed frustration at the lack of structure and order in "who makes what decisions" with a resulting avoidance of "tough issues." Second-year participants shared positive perceptions relating to team input and the opportunity to serve on committees while the negative perception viewed the structure as requiring too many meetings to come to any decision. Participants hired in the third year viewed positively the processes within the teams and the strategic planning process but viewed negatively the "layering" of decisions, the lack of clarity on old
issues such as student attendance, and the continual recycling of old issues.

Comparison of Interview Data to the Historical Record of Events at the Academy

There is little historical data on the decision-making process or changes in it since the opening. The reality may be that there is and never has been a clearly defined process. Although community members speak of participatory decision making, few define the process with clarity of understanding. It appears that a critical junctures and in important decisions (such as the funding and lobbying crisis the first two years, the development of CADRE, the acoustical project, the change in schedule and graduation requirements) there was staff involvement. The issue seems to emerge that there is a difference between participatory and democratic decision making. The Strategic Plan calls for the development of decision trees in all critical decision making areas. Perhaps this will clarify the structure and process of decision making at the Academy.

Other Issues of Change

Participants were asked to share their perceptions of change and the effect of change relating to other issues of change. Although not all participants shared perceptions, the following is a narrative analysis of the content of their responses (1) within and across the areas of inquiry, (2) by
their length of tenure, and (3) in comparison to the historical record of events at the Academy.

Table 11 depicts the aggregated perceptions of the participants to the fourth interview question. The perceptions that emerged were diverse in nature and referred more to the changes in management and structure at the Academy with relation to other places they had worked rather than changes during their tenure at the Academy. It also provided some "rich" cultural data as perceived by the participants. Participants were generally positive in their perceptions.

Content Analysis Within and Across Areas of Inquiry

1. **The physical building:** Perceptions relating to the physical building affected the Academy as an organization and the individual participants. As a place the building is a paradox; the inhabitants love the open feeling and the "space ship" effect and are frustrated by the open building and constant remodeling. They both welcome and resent the remodeling that will modify what they love and hate. As individuals they resent the noise and long for closed space for privacy while they resent the ability of some people to isolate themselves due to the vastness of the building.

2. **Demands on time and high expectations:** Participants shared perceptions in all areas of inquiry with the least effect on the Academy as an
Table 11: Analysis of Data Relating to Other Issues of Change

Other Issues of Change

<table>
<thead>
<tr>
<th>Perceptions</th>
<th>Place</th>
<th>Self</th>
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<tbody>
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<tr>
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<td>2nd Year</td>
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<tr>
<td>Demands on Time and High Expectations</td>
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<tr>
<td>3rd Year</td>
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<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Meaningful Work and Contributions</td>
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<tr>
<td>Intensity of Environment</td>
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<td>1st Year</td>
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<tr>
<td>The Students</td>
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<td>Aggregated Comments</td>
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organization and the most affect on themselves as organizational participants. This category received the most response when participants shared perceptions. Comments were generally more negative than positive and again paradoxical. The intensity of the environment that drives them is often the same driving force that drains and exhausts them. References to multiple and unrealistic demands arose and comments that referred to sacrifices being made with regard to family and their professional life. They shared perceptions of sacrifices their colleagues had made and there was a sense that although the choices made were those of the participants own choosing, they did not know how to make other choices and cut-back.

3. **Meaningful work and contributions:** All perceptions shared, across all areas of inquiry were positive. Participants spoke of the Academy as a safe place where they were not stereotyped, a place where colleagues were "real scientists" and experts, a place where they could make a difference, and the best place they ever worked. They saw the Academy as having a value system and philosophy congruent with their own. They viewed their colleagues and the interactions with them as the most meaningful they had experienced with their own growth as a professional attributed to the environment and the quality of the community members.
4. **Intensity of environment:** Participant perceptions were balanced negatively and positively across all areas of inquiry. Positive perceptions referring to the Academy revealed a sense of a trusting, demanding, confrontive, and dynamic environment. Negative perceptions reflected a sense of too many demands, emotional stress, and no time to recover or innovate. The effects on individuals and their colleagues cited emotional stress due to demands and the inability to have a life outside the environment. There was a sense that individuals do not know how to prioritize among so many demands and expectations.

5. **The students:** The perceptions that referred to the students' effect on the Academy and the individual participants, with one exception, were positive. Perceptions revealed how "wonderful" the kids are and how stimulating they are while some perceived that the selection process brought students to the Academy and kept them when they shouldn't be admitted or retained.

6. **Sharing with colleagues:** Perceptions were shared in all areas of inquiry and were all positive. Participants spoke most highly of their colleagues and "treasured" opportunities to share with them. Participants cited trust, fun, intellectual activity, friendships, and relationships as being valued.
Content Analysis by Length of Tenure

1. The physical building: Participants hired in the second year were less critical than those hired in the other two years. Those hired in the first year referred to the closeness that the building facilitated the first year and the frustration with a lack of private space as the Academy grew. Those hired in the second year spoke negatively about the building dictating program decisions, the constant interference of construction with the instructional program, and the noise factor. Interestingly enough they also spoke positively about the nature of the open building and the positive side of the renovation. Participants hired in the third year were less responsive and less negative citing the acoustical project as a positive decision and speaking negatively about lack of private space to work and conference.

2. Demands on time and high expectations: The perceptions of all three years of hire were equally distributed with most comments negatively stated. Again the paradox of intensity and exhaustion surfaced. Participants hired in the first year were more expressive about the exhaustion and the ability to continue at the same pace. One member spoke of the "half-life of IMSA". While they viewed positively the intellectually demanding and confrontive environment, they also spoke of no recovery time and unrealistic expectations. Second-year participants referred to the stimulating yet exhausting
environment, the issue of no "down time," the trusting and safe environment, and perception that each year there are more expectations and each year people make more sacrifices. Some participants hired in the third year spoke of their appreciation of free time while others spoke of the exhaustion and "no life outside IMSA." While the intensity was viewed as rewarding it was also viewed as too demanding. Participants spoke about guilt if they went home before their colleagues and "mom guilt."

3. **Meaningful work and contributions:** The perceptions of all three years of hire were equally distributed and all positive. References to contributions to education, making a difference, values congruent with the Academy's, love of work, a safe place free of stereotyping, and the professional growth opportunities were common and across years of hire.

4. **Intenity of environment:** Perceptions were equally distributed across all years of hire. While those hired in the first year thought the intensity could not continue at the same level; they also felt it was a safe and trusting environment. Those hired in the second year spoke of the paradox of exhilaration and fatigue and the belief that the change is what is exciting. Those hired in the third year spoke of the stress and depression and also referred to the Academy as the best place they ever worked. One stated that the faculty was like the students, gifted, self-driving, intense, and demanding.
5. **The students:** Participants hired in the third year did not share perceptions while those hired in the first and second year spoke of the needs of the students as rewarding to them. They also spoke of the students as intellectual equals and referred to them as "wonderful." The only negative comments referred to the belief that not all of the students should be admitted or retained.

6. **Sharing with colleagues:** Perceptions were shared equally across all years of hire and were all positive. Those hired in the first year spoke of trust, fun, relationships, friends, and conversations. Second-year participants spoke of friends, "real scientists," conversations, and the high quality of professionals. Those hired in the third year spoke of relationships, true professionals, "intellectual sparring matches," and the opportunity to share ideas.

**Comparison of Interview Data to Historical Record of Events at the Academy**

It is difficult to tie the interview data in this category to historical events. Chapter IV describes the setting and the environment as best one can in definitive terms. The participants in their interviews took this opportunity to speak to what they felt was unique and a change from other environments in which they had lived and worked. Their perceptions are rich, intense, real, and honest.
Summary

In this chapter, the researcher presented the analysis of the data derived from the interviews with twenty-four members of the Academy faculty and administration. The findings are presented within the framework of the analysis of the data (1) within and across the areas of inquiry, (2) by length of tenure, and (3) in comparison the the historical record of events at the Academy. The analysis is comprehensive and detailed in support of the data gathered. It was also the intent of the researcher to convey to the reader the qualitative nature of the responses of the participants.

Participants were open, candid, thoughtful, and reflective in their responses to the concept of change and the effects of change on the institution, themselves, and their colleagues. The nature of their responses resulted in the gathering of "rich" cultural data that may not be adequately reflected in the tables or the narrative analysis. This observation by the researcher is noted for the reader's benefit as it may enhance the reader's context of viewing the findings of the study as presented. To the extent possible, Chapter VI takes into account the richness of the responses in the discussion of the organizational culture of the Academy.
CHAPTER VI

DISCUSSION AND IMPLICATIONS OF THE STUDY

This study examined the concepts of organizational culture and organizational change. In support of the study, Chapter II provides a review of the literature. Chapter V presents a detailed account of the findings of the study. Chapter VI discusses the findings of the study and the implications of the findings within the context of (1) the effects of change in management and structure and (2) the review of the literature.

Within the context of the effects of change in management and structure, the findings are discussed as they are presented in Chapter V:

1. The effects of change within and across the areas of inquiry
2. Effects of change by length of tenure
3. Comparison of data to historical record of events at the Academy

The discussion of the findings in this chapter summarizes the perceptions of the participants referencing the areas in which the participants perceived the greatest and least effects of change. Review of the findings in Chapter V resulted in the researcher "stepping back" from the data and assessing the areas of change in which the participants were the most and least passionate, expressive, or reflective. This approach provides the reader a synthesis of perceptions relating to
effects of change in management and structure at the Academy.

The discussion of the findings, with reference to the review of the literature, provides the reader with a view of how theory from research may have applicability at the Academy. The findings are discussed within the context of the review of the literature as it is presented in Chapter II:

1. Change in educational communities
2. The culture of educational communities
3. Other ethnographic studies in educational communities
4. IMSA/INSYS research data from the first year of operational the Illinois Mathematics and Science Academy

The findings, as discussed within the context of the review of the literature, may have implications for other educational communities undergoing change.

Discussion of the Findings in Relation to the Effects of Change in Management and Structure

Participants were asked to share their perceptions of the effects of changes in management and structure on the Academy as a place, themselves as organizational participants, and on their colleagues as organizational participants. As Chapter V details, the data derived from the perceptions was analyzed by content analysis within and across the three areas of inquiry, by length of tenure, and by comparison to the historical record of events at the Academy.
A summary of the findings found in Chapter V warrants discussion within the context of the analysis.

**Effects of Change of Within and Across the Areas of Inquiry**

The perceptions shared by the participants focused more on the effects of changes on the Academy as a place than on themselves or their colleagues as organizational participants. The perceptions focused the least on the effects of change on their colleagues. The following notes summary comments within the areas of inquiry.

1. **Effects of Change on the Academy as a Place:**
   When sharing perceptions of the effect of change on the Academy as a place, participants were most expressive in the following areas respectively:

   a. Governance
   b. Size of the Faculty and Administration
   c. Other issues of change

   Participants were least expressive in the area of funding. The most positive perceptions related to other issues of change, specifically the changes in the Academy environment as it differed from other educational communities. The most negative perceptions dealt with the rapid growth in numbers of faculty and administration and the resulting perceived loss of community and family.
2. **Effects of Change on Themselves as Organizational Participants:** The participants were most expressive about the effects of change on themselves in the following areas respectively:

   a. Other Issues of Change  
   b. Leadership  
   c. Governance  

Participants were least expressive about the effects of changes in the size of the student body. Positive perceptions dealt most with the changes in opportunities to share with colleagues, opportunities for personal growth, the unique intensity of the environment, encouragement and support to innovate, and the autonomy given them as professionals. Negative perceptions focused on the intensity of the environment that was exhausting and the unrealistic expectations of performance.

3. **Effects of Change on Colleagues as Organizational Participants:** Participants were most expressive about the effects of change on their colleagues in the following areas respectively:

   a. Governance  
   b. Other Issues of Change  
   c. Leadership  

They were least expressive about the effects of changes in funding. Perceptions relating to governance were weighted negatively and focused
on increased bureaucratic structures, increased rules and policies, the impact of the Strategic Plan, and lack of clarity in reporting and supervision. The researcher noted a tendency for the participants to project negative comments in these areas when speaking of the effect on their colleagues, perhaps as a way of expressing concerns without admitting the effect on themselves. Likewise, perceptions dealing with other issues of change focused on a concern that colleagues could not continue the pace without large sacrifices. Perceptions were more positive when speaking to the effect of support and encouragement for colleagues from the Academy leadership.

Across the areas of inquiry, participants were the most expressive in sharing their perceptions of the effects of changes in management and structure in the following areas respectively:

1. Other Issues of Change
2. Governance
3. Leadership

Participants were the least expressive when speaking to changes in the area of funding. Again it is noted that when speaking of other issues of change, participants spoke positively about the differences in the Academy from other educational communities with regard to interactions with colleagues, opportunities to do meaningful and important work, and the intensity of the environment. They spoke negatively
about changes in governance resulting in bureaucratic structures, rules, and policies. They spoke positively about the encouragement and support from the leadership and autonomy realized.

It is interesting to note the perceptions relating to changes in funding. One would have suspected more response as a result of the first two years of turbulent funding and continued existence. It appears that financial safety and security, although issues in the first two years, are no longer critical issues affecting the participants.

Effects of Change by Length of Tenure

Participants hired in the first year were the most expressive and participants hired in the third year were the least expressive. This is not surprising and was anticipated by the researcher. It would stand to reason that the length of exposure to the environment would enhance and expand the perceptions of the participants.

1. **Participants Hired in the First Year**: Participants were most expressive when sharing perceptions relating to the following respectively:

   a. Leadership
   b. Governance
   c. Other Issues of Change

   The were least expressive on the issue of funding. Perceptions shared were very positive when speaking of the leadership style of the Director
with mixed perceptions about the additions of roles and functions. In sharing these perceptions, first-year people view themselves as the founders and hold tremendous sentiment for the first year, the small, close community that evolved, and the close working relationship with the Director. The additions of roles and functions, although perceived as positive in distributing the responsibilities, are also perceived as a loss of the closeness. The participants hired in the first year hold nostalgic memories that are unique to them and they hold them with pride. It is this self perception that when expressed to in some arenas, has caused resentment and division among some first and second year people. It is obvious that the growth in numbers and the passage of time has reduced this tension, however, undertones exist among some community members.

With sharing perceptions of change in governance, first year participants view negatively the effects of increased bureaucracy and rules. When speaking of other issues of change, they are the most expressive about the intensity of the environment resulting in exhaustion. This, too, stands to reason as they have been exposed to the intensity the longest.

2. **Participants Hired in the Second Year:** Participants were most expressive when speaking of the effects of change in the following areas respectively:
a. Other Issues of Change
b. Governance
c. Size of the Faculty and Administration

Participants were least expressive in the area of decision making. Perceptions dealing with other issues of change focused positively on sharing with colleagues and doing meaningful work, and negatively on the intensity and exhaustive environment. When speaking to the changes in governance, they were more negative than first-year informants and spoke to lack of clarity in reporting and supervision and the impact of Strategic Planning. When speaking of the size of the faculty and administration, they were negative about the increases in functions and the loss of intimacy.

As a group, participants hired in the second year were more negative than those hired in the first or third year. As mentioned earlier, resentment toward the first year emerged. While negative effects of change expressed by participants hired in the first year focused on colleagues, negative effects expressed by those hired in the second year focused on the institution. The analogy to family, and the addition of a second and eventually the middle child status, may be very applicable to these participants hired in the second year.

3. Participants Hired in the Third Year: The perceptions of the participants hired in the third
year were the most positive yet they were not as expressive as those hired in the other two years. This, too, is understandable as they have witnessed the least change simply by length of tenure and were not a part of dramatic changes related to "crises" in the first two years. The perceptions shared by the participants hired in the third year focused on the following respectively:

a. Other Issues of Change
b. Governance
c. Leadership

Their perceptions focused the least on the issue of funding. Their perceptions dealing with other issues of change were similar to the other informants when speaking of interactions with colleagues and opportunities to do meaningful work and they were equally concerned with the demands of the environment. While the first-and-second year informants spoke negatively about changes in governance, third-year participants spoke more positively about increased rules and parameters and the Strategic Planning Process. When speaking of leadership, they were far more positive than their colleagues when speaking of the team leader role and similar to their colleagues when speaking of autonomy, encouragement, and support.
Comparison of Data to Historical Record of Events at the Academy

For those who live through events, the impact is more real than for those who learn of it through stories or historical literature. So it would seem that the perceptions of the participants are more varied and passionate with relation to length of tenure at the Academy. It is most interesting to note the lack of emphasis that the issue of funding received from participants in the first and second years of the Academy's existence. They speak of the crisis of the time with nostalgia and humor more than agony. It is almost a moot issue at this time with relation to security of existence.

The effects of change in structure and management are closely tied to the historical events and the people that were part of the change. It was interesting to note that the participants viewed changes during their tenure at the Academy less passionately than the changes from other environments in which they had lived. There appears to be a "draw" and attraction to the Academy because of these perceived differences in collegiality, opportunities to do meaningful work, autonomy, and intensity. This was supported and affirmed by participant responses in the first year research at the Academy (School Administrators Service Associates, 1986-87).

Expressed anxiety, as well as excitement, relating to the Strategic Plan is another paradox that emerged from the research. The Plan is indeed an ambitious attempt to bring about systemic change in the educational delivery system. It promises to be both challenging and exhausting for the participants. The paradox of fear and excitement is predictable when such dramatic change is proposed.
Discussion of the Findings Related to the Review of Literature

The following discussion focuses on the findings of the study as they support specific or general concepts or theories cited in the review of the literature found in Chapter II.

Change in Educational Communities

The Illinois Mathematics and Science Academy, as created by Senate Bill 730, The Illinois Comprehensive Educational Reform Act of 1985 (Appendix E), is by definition and mission a change in the educational system and community and serves as a change agent for mathematics and science education in the State of Illinois. It emerged at a time when the educational reform calls of the Nation established a climate of change. It is a bold effort to change the status quo typical of educational systems (Saleh 1987, Meyer & Rowen, 1983). The delivery system, environment, and mission of the Academy are dramatic changes from the traditional school setting. As the third such school in the Nation at the time of opening, the Academy stands as an model of change.

Fullan (1982, cited in Corbett, Firestone, & Rossman, 1987) cites that "change depends on what teachers do and think - - its as simple as that" (p. 107). A review of the analysis of the data in Chapter V indicates, that what the teachers do and think at the Academy is far from the status quo and static state typical of educational communities (Chapey, 1985). The perceptions of the faculty and administration interviewed reflect a high sense of autonomy, the opportunity and challenge to innovate and experiment, and a dynamic environment described as intense, open, collegial,
confrontive, and demanding. The perceptions are often paradoxical as participants speak of the stimulating yet exhausting intensity, the frustration of too slow and too rapid change, the frustration of too little and too much input into decision making, and the challenging yet unrealistic demands and expectations.

When speaking to the concept of change, and voluntarily talking of changes at the Academy in comparison the other environments in which they lived and worked, the participants shared perceptions that revealed a "love of work," the opportunity to risk and fail, a "rekindled love of teaching," the concept of a "safe place," and the sense that they were "making a difference" and "doing incredibly meaningful work." Such perceptions are not typical reactions to change by teachers who fear and resist change (Deal, 1987). Teacher resistance to change is often viewed as a threat and challenge to the professional identity of the teacher (Corbett, Firestone, & Rossman, 1987). At the Academy the participant perceptions indicate that the changes support and enhance their professional identity and growth.

Chapey (1985) cites that resistance to change in educational communities results from the static state, opposed to the dynamic state, characterized by the following:

1. Authoritarian leadership
2. Archaic structure with excessive layers of management
3. Mechanistic approach to problem solving; repeat whatever was done before
4. Isolation of teachers from decision making
5. No sunset policy for programs that are no longer workable or needed
6. Interdisciplinary planning not encouraged
7. Quantitative oriented managers lack an understanding of the psychology of the organization.

8. The spirit of adventure and risk and experimentation are lacking.

The perceptions shared by the interview participants contrast the characteristics cited by Chapey and support the existence of a dynamic state.

1. Authoritarian leadership: The perceptions support the existence of strong and visionary leadership in the Academy Director and other key administrators. The perceptions also reflect a sense of shared leadership in the team leader role and the autonomy existent in the discipline teams. The leadership style perceived as open, collegial, and "wonderful" contrasts the definition of authoritarian.

2. Archaic structure with excessive layers of management: The actual structure of the Academy is still evolving. The frustration expressed by some participants relating to supervision and reporting are not typical frustrations expressed relating to archaic structures of management. The fact that the structure is still evolving and the expressed fear of layering and bureaucratic structures supports the concept of a dynamic and evolving state. If there is a frustration of participants it is in the absence of clearly defined structures of management that they relied upon for clarity in other settings.

3. Mechanistic approach to problem solving: repeat whatever was done before: The perceptions shared by participants were paradoxical with frustration in lack of precise problem solving and decision making processes and yet a resistance to set in place top-down and non-participatory processes. The slow and
hybrid approaches to many issues was perceived as frustrating because of the revisiting of issues, yet the input and involvement of the participants was perceived as critical. The absence of official Board policy in the early stages, and the continuance of policy being developed as needed was paradoxically viewed as flexible and appropriate yet reactionary and "knee jerk."

4. **Isolation of teachers from decision making:**
Perceptions revealed a balance of positive and negative reactions to the issues of too little input and too much input in decision making. Specific references cited examples of critical teacher input as well as those citing too little input. Perceptions tended to express a need to more clearly define the process to assure continuance of participatory decision making. Specific references to incidents of teacher involvement contrast the isolation typical of other communities. Several perceptions referring to the "swarming around problems" and "management by swarm" would indicate that the ill-defined processes have adequate, if not too much, input.

5. **No sunset policy for programs that are no longer workable or needed:** Although clearly defined policy does not exist that dictates a sunset policy, the perceptions cited instances in which a sunset policy exists. Examples of changes in non-workable programs and processes included the class schedule, the acoustical problems and projected student enrollment, the CADRE document, the graduation requirement revisions, and sophomore physics.

6. **Interdisciplinary planning not encouraged:** Although some participants shared disappointment in the lack of development of interdisciplinary courses, it is evident that interdisciplinary planning is
encouraged. The Strategic Plan calls for interdisciplinary planning and resulting courses in the development of a concept-centered curriculum, the implementation of discovery learning, and the re-definition of student achievement and success. There is also evidence of interdisciplinary activity in the existing courses "Big Bang to Now," "Science, Society, and the Future," and "Utopia-anti-Utopia." The early and continuing literature speaks to the call for interdisciplinary approaches and dialogue.

7. Quantitative oriented managers lack an understanding of the psychology of the organization: The perceptions relating to quantity and quality are again paradoxical. Perceptions revealed an invigorating, stimulating, demanding, and intense environment that was both rewarding and exhausting. The intensity both feeds them and stresses them. The expressed perceptions that there is too little time to meet the excessive demands may deem that the issue of quantity and quality be examined by the members of the community.

8. The spirit of adventure and risk and experimentation are lacking: The perceptions of the participants were precise and unanimous when referencing the opportunities and encouragement received to innovative, create, risk, and fail. The recruiting literature that calls for "educational entrepreneurs" is a reality in the people recruited and retained at the Academy.

The review of the literature in Chapter II included some research in organizational change other than educational communities. The work of Kanter (1983, 1989) speaks to the effects of change and the characteristics of organizations open to and involved in the change process. In When Giants
Kanter (1989) examines the "post-entrepreneurial" organization that by definition "creates a marriage between entrepreneurial creativity and corporate discipline, cooperation, and teamwork" (p. 10). Of particular interest is Kanter's view that change is creative innovation and revolution demanding "creative destruction" of the old ways with replacement of the dinosaurs through adaptation to new innovation. The perceptions of the participants when relating to opportunities for innovation, creativity, autonomy, and encouraged risk, support the existence of a climate adaptable to change at the Academy.

Kanter (1989) refers to the post-entrepreneurial organization as a "newstream" opposed to a "mainstream." Newstreams are characterized as having (1) high autonomy, (2) high uncertainty, and (3) high intensity. The perceptions expressed by the interview participants support Kanter's theory and define the Academy as a newstream in the following ways:

1. **High autonomy:** The perceptions of the participants reveals a broad-based sense of high autonomy among community members. The perceptions shared relating to autonomy ran across all three areas of inquiry citing positive effects on the organization, the individual participants, and their colleagues. Perceptions reflected a sense of support and encouragement from the Academy's leadership and a resulting sense of professional growth and development.

2. **High uncertainty:** The historical data supports the high uncertainty that existed in the early years. Beyond this, perceptions relating to curriculum, decision making, and governance also reflect a sense
of high uncertainty. The approval of the Strategic Plan created yet another sense of uncertainty as it called for "revolutionary" changes in the curriculum, student assessment, and organizational structure. The dynamic environment of the Academy, as expressed in the perceptions of the participants, is typified by uncertainty that is paradoxically invigorating and frustrating.

3. **High intensity:** The perceptions of the participants revealed in all cases the high intensity of the Academy. Again, the paradox surfaced between exhilaration and exhaustion as the effects of the intensity.

Kanter's concepts of "cultures of pride" (1983) and "post-entrepreneurial" organizations (1989) that are characteristic of high performance organizations are supported by the perceptions of the Academy interview participants. She speaks of a synergy among the organizational participants that is also supported by the participant perceptions when they speak of their colleagues, their meaningful work, and the opportunities to share and contribute to change.

**The Culture of Educational Communities**

As the newest school of thought in the field of Organizational Development, the concept of organizational culture is still illusive and controversial (Shafritz & Ott, 1987). The research relating to organizational culture is qualitative in nature and less adaptable to traditional research methodology (Shafritz & Ott, 1987). Ethnographic studies provide the best source of data in the study of organizational
culture as the researcher becomes immersed in the field experience and through interviews and observations collects and elicits the "native view" (p. 157) of reality and the native ascription of meaning to events, intentions, and consequences (Spindler & Spindler, 1985). As a case study, with the researcher serving as a participant-observer, this study was a simplistic form of ethnographic research with the qualitative data revealing in part the culture of the Illinois Mathematics and Science Academy.

By definition, culture is the mental life and social structure of a community (Redfield, 1967), the social energy that moves people to act (Kilmann et al., 1985), and the pattern of basic assumptions that a given group has invented, discovered, or developed in learning to cope with its problems of external adaptations and internal integration (Schein, 1983). Culture is in essence a socially constructed reality with each culture unique to the organization (Martin & Siehl, 1983, cited in Shafritz & Ott, 1987). Sergiovanni and Corbally (1984) note that we can only define the culture by understanding the experiences of the individuals who comprise the community. The perceptions of the interview participants provide a rich source of qualitative data that defines in part the culture of the Academy.

As a young community, the culture of the Academy is still evolving. Schein (1983) and Johnson (1987) cite that evolution and cultural change in the early life of an organization are tied to the founders and are best achieved through hybrids developed by the members of the community and heavily based on community values and assumptions. As an accepted premise, this would imply that the founding Board of Trustees, the Academy Director, and the staff involved in the early development and evolution of the Academy defined the
culture that evolved and exists today. Chapey (1985), cited in the literature on change in educational organizations, supports this theory stating that changes in education will be possible only when creative and visionary leadership, coupled with a strong organizational culture exists.

As a participant-observer, the researcher cannot clearly define or describe the culture of the Illinois Mathematics and Science Academy. Judgements or conclusions relating to the strength or "character" of the culture would be subjective statements and inappropriate. Redfield (1967) referred to this as the "ethnographical dilemma"; a problem of cultural understanding of how to understand, define, and explain the experiences of someone else. The study of culture then leads to the use of words and thoughts that are not readily acceptable to natural science but more appropriate to a drama or literary art (Redfield, 1967). Quotations from the interviews best define the culture and are left to the reader's interpretation and judgement.

"This is what can happen in schools. This is probably the last opportunity I have to provide a real school-based kind of legacy."

"I don't know how long I can survive -- I don't know if there is a half-life at IMSA -- maybe there is -- I don't know, I've often talked about what's life after IMSA? Its hard to imagine. Its a lot easier I think to imagine what life is like after XYZ high school, but in a sense, after IMSA, I don't know."

"I'm not persecuted here -- the individuals make the difference."
"I think we have become more bureaucratic and I don't like that. However, I think the bureaucracy is more related to personalities than it is to organizational structure, I really do."

"I have taken more risks here, personally and professionally than I have ever taken before."

"I think a lot of people have grown up here because it has been basically a trusting and caring organization."

"This is not a place where you can really equivocate very easily."

"I still think we are doing incredibly important work."

"It's fun here, I mean, we really do laugh a lot."

"That's what excites me about this place right now, I'm in a situation where my value system is in tune with the cultural value system, and it's very fresh because my past experience hasn't been that way for a long time."

"I am fed by the intellectual energy and stimulation. The sense that I am really contributing to something as revolutionary and so incredibly important that will impact for years and years and years a lot of people, places, and things. I guess that is a fancy way of saying making a difference."

"This is the first place I've been where I can really be me, and not stereotyped."

"This has been like three years of sabbatical leave, I understand more about education; and I thought I had a pretty good handle on it before."
"Working with people that I consider my peers has been just marvellous fun. They have made it possible for me to grow in other areas."

"The real excitement of my professional life and things that have made this job the most exciting one I have ever had has been all that stretching, all those challenges."

"What's nourished me here is that there were people of good will with the same goals and values and the same kind of commitment and that's been enormously supporting and nourishing."

"The kids, their excitement and enthusiasm and their attitudes toward each other create an environment that is almost like the building itself. Its something that is just there, its in the air. Its palatable when you walk into the door in the morning and you know you've left it when you walk out at night."

"This place has rekindled my love for teaching."

"I love this place so much. Even though its so draining I wouldn't want it any other way. I don't know what we can do to protect us from ourselves."

"There have been more opportunities here in three years than I had in my past 20 years, considerably more."

"This place is addictive, its as addictive for the kids as it is for us. We're so intertwined here."

"We have a habit here of trying to do everything."

"I came here to be part of an experiment -- I love experiments and I love change - I thrive on that. I knew that this would be successful."
"I can't imagine anyone staying here who doesn't love change. If it just didn't fuel them it would drive them crazy."

"I have met here a group of professionals that inspired me, that led me to believe that I could become more than what I was and I see a group of people that are as committed or challenged by professional opportunities as I want to be."

"I have a philosophy of life that you have to keep growing, and I can't think of any place except this place that you can do that more. It stretches. At times I feel like a rubber band right before you shoot it, but it's great."

"I'm not feeling it yet, that I can't keep this up -- but I wonder if it's is a matter of a "life cycle." After a certain number of years, am I going to leave?"

"This is one of the few institutions in this country that I've encountered where intellectual activities are actually treasured."

"We have a great tendency to forget about continuity, and only think about change, and I think that it is important that we remember as well as look forward."

"It is the best job I ever had, because I am happy to come to work. I have this professional life, and I never thought I would have that -- and I'm not going to go because I'm afraid there is not any place like this out there, although I am sure that if this place collapsed that I'd find a place, I'd cry and then I would recover."

Lightfoot (1986), in her research on "goodness in schools," found that good schools had a strong culture that was
educative and nurturant. The perceptions of the participants tend to express a sense of this.

The repeated comments and references to the sense of family and loss of intimacy in the first and second years warrant discussion within the context of the culture that evolved at the Academy. Redfield (1967) notes that the evolution of a culture within a community is analogous to a life and death cycle. Deal (1987) supports the concept when he speaks of the need for symbolic burials with reference to rites, rituals, ceremonies, and loss. Small communities are distinctive with defined boundaries that are apparent to the members and outsiders, they are self sufficient, and they are homogeneous (Redfield, 1967). In the first year, and into the second, the members of the Academy were analogous to a small community, they were even bound by a sense of survival due to impinging outside forces, a fact that created greater unity and self-sufficiency. The references to bonding and unique relationships in those early days were real life experiences for the members of the community. As the community enlarged, and the crisis for survival became less threatening, the members began "hiving off" within the community with less distinct and less defined boundaries with new members whose addition created less homogeneity (Redfield, 1967). The changes that occurred early in the history of the Academy carried with them a sense of loss for the members; it was a predictable and a typical reaction to change (Marris, 1974).

The perceptions of the participants that relate to the issue of time and exhaustion also relate to the culture that evolved. The perceptions shared often reflected a sense of questioning as to how long they could continue at the pace the Academy expectations set on them. Some participants
acknowledged that their choices to "push" were self-imposed while others externally referenced the demands as expectations over which they had no choice. Coupled with the comments of exhaustion were the positive references to the intensity of the environment that stimulates and "feeds" them and their sense that their work is meaningful and important. Due to the prevalence of the perceptions from most of the participants, the issue becomes a defining characteristic of the culture of the Academy. Whether the resulting and observable behavior is perceived to be commitment, devotion, or dedication, it is perceived by the participants to be a self-imposed or externally-imposed expectation that is creating concern among the members of the Academy community.

As noted in Chapter II, the review of literature did not include extensive review of the Leadership research with the exception of a limited inclusion of literature referring to women in leadership roles. The literature is included due to the number of women in leadership roles at the Academy since the opening. In the first year, five of the seven administrators were women. In the second year five of the nine were women. In the third year six of the ten were women, and in the fourth year seven of the eleven are women. This is a profile non-typical of the leadership of educational communities (Shakeshaft, 1987). Sweeney (1982, cited in Shakeshaft, 1986) notes the research on female school administrators that conceptualizes the female world of school administration:

1. Individuals are the most important link, including student, staff, and parents. Higher morale results.
2. Teaching and learning is the major focus with emphasis on achievement and the instructional program. Teachers are supervised more.

3. Building of community is an essential part of the female administrative style. The staff have higher job satisfaction and are more engaged in their work. They demonstrate a more democratic and participatory style that results in inclusiveness rather than exclusiveness.

The research of Jones (1986) supports the premise noting that the environment and culture created by female school administrators is more collaborative and decision making is more decentralized. Shakeshaft (1986) notes that female school administrators create an "altered environment," a female culture, as a result of differences in communication, leadership, and decision making styles. The literature is cited as interesting in relation to the perceptions shared by the interview participants at the Academy. Quantitative data, if gathered on this issue, may support or repudiate a possible correlation. However, this study does not provide the data other than the qualitative data gathered from the perceptions of a sample of the community. Based on the perceptions expressed relating to leadership, meaningful work, governance, and decision making, there tends to be support for the research noting an "altered environment."

Other Ethnographic Studies in Educational Communities

A very brief description of other ethnographic studies in educational communities is found in Chapter II. These studies are cited as support of the value of ethnographic research in
the study of culture and the cultural process. There is no correlation of the studies to this study. They simply provided an interesting base of reference for the case study process used by the researcher. Each of the studies cited were more clearly ethnographic research with a researcher immersed in the culture as an unbiased observer for a long period of time.

Each study (Cusick, 1973; Goldhammer & Farner, 1964; Lightfoot, 1986; Singleton, 1967; Smith, 1966; Wax, Wax, & Dumont, 1964; Wolcott, 1973) provided support for the value of qualitative research when studying social systems, particularly the meanings and relationships of the community members.

Wax, Wax, and Dumont (1964), in their study of the Dakota Indian culture, found that the participants expressed feelings that the study was important. Participants at the Academy also expressed feelings that this study was important. It was interesting and gratifying to find that only one of the original sample participants chose not to be interviewed. Each of the others appeared eager with the interview scheduling complete long before the researcher anticipated. The openness and candor of the participants was also gratifying as it supported the validity of the data.

Smith (1966), in a study of change in a small research center, interviewed participants to determine their perceptions of the effect of change. Similar to the perceptions of the participants at the Academy, Smith (1966) categorized perceptions relating to communication patterns, bureaucratization, formation of subgroups, transition, and leadership. Again, the research provided support for the value of the process as well as the emerging issues of the effect of change.
The research of Lightfoot (1986) was the most recent and applicable to the study at the Academy. It provided a reference to similar findings relating to the culture of schools that supports "goodness" and the empowerment of faculty. Her findings relating to the nurturing and feeding of teachers were supported by the perceptions of the participants at the Academy. Similar to the perceptions of the participants at the Academy, the perceptions of the faculty in Lightfoot's (1986) study were not all positive. Her comment clarifies the value of conflicting perceptions:

It is unconceivable that any institution would ever establish an equilibrium that satisfied all of its inhabitants, where values closely matched behaviors, and where there was no tension between tradition and change. (p. 14)

In her study of six "good" schools Lightfoot (1986) concluded that one quality of good schools is their ability to recognize and articulate imperfections. Academy participants openly recognized and articulated imperfections.

IMSA/INSYS Research Data from the First Year of Operation at the Illinois Mathematics and Science Academy

In the first two years of the Academy's existence, School Administrator Service Associates (1986-87) conducted research with the Academy staff, at the direction of the Board of Trustees, in an effort to establish a data base for ongoing research relating to the Academy, the students, and the personnel. Several volumes of data, known as the Illinois Mathematics and Science Academy Information System
(IMSA/INSYS), detail the quantitative and qualitative data gathered as a result of administering questionnaires to the members of the community.

A review of the entire research base is not included in Chapter II. As a base of reference, the researcher reviewed much of the data, especially that referencing the perceptions of faculty and administration, in an effort to determine changes in perceptions over the three years. In no way was the study a replication of the research conducted by School Administrator Service Associates. Any similarity in the findings or discussions are a result of similar responses by the participants, many of whom responded to the questionnaires in the first two years. A review of the IMSA/INSYS (1986-87) data reveals a higher level of response by participants in the first year of the research than in the second year.

The narrative data in the IMSA/INSYS (1986-87) served as a base for the qualitative analysis of data by School Administrator Service Associates. The research notes the diversity of perceptions of faculty and administrators with recurring, common focus on several issues. Perceptions relating to the achievement of goals, time and work overloads, and uncertain funding surfaced as concerns and hindrances. Perceptions cited recurring conditions for the achievement of goals as:

1. Administrative support, including encouragement, approval, recognition, commitment to new ideas, high expectations, and opportunities for input into decision making.

2. The students, including student capabilities and openness and the challenge of learning with them.
3. Professional colleagues, including professional competence, enthusiasm, cooperation, mutual respect for talents, trust, and unity.

4. The IMSA environment, including experimentation, innovations, flexibility, academic freedom, risk taking, and a commitment to success.

It is interesting to note the similarity in findings of the IMSA/INSYS (1986-87) research and the perceptions of the Academy participants at the time of this study. In each category of hindrances and conditions for achievement, the data is similar and supportive of the findings of both studies. The consistency of perceptions, through three years of evolution and growth, with a sample of perceptions from a broader constituency of community members is at the least interesting.

Summary

The Illinois Mathematics and Science Academy, by nature of the legislation that created it (Appendix E), is a change agent. Beyond this mandate of reform for mathematics and science education, the Academy's Strategic Plan (Appendix I) calls for dramatic reforming, if not "renorming" of educational practices, pedagogies, and methods of assessment. In the brief history of the Academy, the members of the community have witnessed both evolutionary and revolutionary change with the effects of both impacting the culture of the Academy and individual participants.

Change that is evolutionary is often predictable. As a community grows and evolves, some changes are predictable and the effects of change can be anticipated. Even though
members of the Academy community entered the environment fully aware of the reform calls addressed in the mission and goals, historical events, coupled with unforeseen challenges, often placed the Academy and the organizational members in a state of turbulent change. At these times, members of the community were drawn together by common values, beliefs, and commitments that formed the basis for the culture that evolved.

The paradoxical issues that emerged from the study are perhaps to be anticipated, as change brings with it a state of disequilibrium and a shifting of views and perspective while trying to hold tight to the values that define our personal and professional lives. The expressed sense of loss, the sense of exhaustion and exhilaration, the need for autonomy and professional support, and the need to contribute and make a difference are expressions typical of a community undergoing change. Change is often a painful process, even when the choice is willingly made.

This study examined the culture of the Illinois Mathematics and Science Academy through the perspective of the effects of perceived changes in management and structure since the Academy's creation in 1985. It presents findings that are interesting and it may generate other questions for study relating to the creation of an organizational culture.
REFERENCES


Bookover, W., Beady, C., Flood, P., Schweitzer, J., & Wisenbaker, J. (1979). *School Social Systems and Student*


Appendix A

Interview Participants

Participants selected for the study included:

**First-year personnel hired in the Fall of 1986**
- Academy Director
- Chemistry faculty member
- English faculty member
- Mathematics faculty member
- Foreign language faculty member
- Foreign language faculty member
- Social science faculty member (social science team leader)
- Communications officer

**Second-year personnel hired in the Fall of 1987**
- Mathematics faculty member
- Physics faculty member (physics team coordinator)
- Physical education faculty
- English faculty member (English team leader)
- Mathematics and Physics faculty member
- Mathematics faculty member (Mathematics team leader)
- Director of the Information Resource Center
- Academy Principal

**Third-year personnel hired in the Fall of 1988**
- English faculty member
- Social science faculty member
- Social science faculty member
- Social science faculty member
- Physics faculty member
Appendix A continued

Physics faculty member
Social science faculty member
Director of Academic Programs
Appendix B

Letter of Participation

March 11, 1990

Dear: 

For the past three years I have been enrolled in a doctoral program in Educational Administration at Northern Illinois University. In the Spring of 1989 I completed the course work and successfully completed the special and comprehensive examinations for the program. At the current time I am beginning the field work to complete my dissertation.

With the approval of my dissertation committee and Dr. Stephanie P. Marshall, I am planning to complete an ethnographic case study at the Academy focusing the concept of change and the effect of change on the professional growth and development of faculty and administrators. This study will include personal interviews with nineteen (19) faculty members and five (5) administrators representing individuals hired in the first three years of the Academy's operation. Based on a stratified random sampling of first, second, and third year personnel, your name was selected as a potential interviewee for the study.

The interview was developed in an effort to determine individual perceptions of change and the effect of change on the professional, and perhaps personal, growth of you as an
organizational participant and on your colleagues. I anticipate that the interview will last approximately 45 minutes and I am requesting that I be allowed to tape the interview to facilitate transcription of your responses. All data will be treated confidentially with responses and findings reported in aggregate form.

I would like to conduct the interviews during March and April of 1990. Although I would prefer to conduct the interviews after 4:30 p.m. or on weekends, Dr. Marshall has agreed to "flexible" scheduling in relation to my work in order to accommodate some interviews being conducted during normal working hours and at your convenience. Because my timeframe is short, and my excitement to complete the process is high, I am requesting that you respond to me by March 19, 1990 your willingness to participate in the study. You can contact me at 801-6036 at work or 892-8336 at home. I sincerely appreciate your consideration in this matter and hope that you can be a part of the study. If you would like to see a copy of the proposal or if you have questions or concerns, please feel free to contact me.

Sincerely,

Connie Jo Hatcher
Appendix C

Interview Protocol

Name: ____________________________
Position/title: ______________________
Hiring date: ________________________

The following questions comprise the interview schedule:

Area of Inquiry: Perceptions of changes in management and structure of the organization.

Question #1: Over the past four years the management and structure of the Academy has changed. What changes have you witnessed and what are your perceptions of the impact of these changes on the Academy?

- size of student body
- size of faculty and administration
- governance
- funding
- curriculum
- leadership
- decision making processes
- other

Area of Inquiry: Perceptions of how changes in management and structure affected the professional growth and development of the respondent as an organizational participant.
Appendix C continued

Question #2: How have the changes in management and structure affected your professional growth and development as a member of the Academy community?

- size of the student body
- size of the faculty and administration
- governance
- funding
- curriculum
- leadership
- decision making processes
- other

Area of Inquiry: Perceptions of how changes in management and structure affected the professional growth and development of other organizational participants.

Question #3: In your opinion, how have the changes in management and structure affected the professional growth and development of your colleagues?

- size of the student body
- size of the faculty and administration
- governance
- funding
- curriculum
- leadership
- decision making processes
- other

Question #4: Are there other questions relating to the Academy that affect professional growth and development that I should have asked? Please discuss these with me.
Appendix C continued

INTERVIEW SCRIPT

The following is the script used by the researcher at the beginning of each interview:

"Thank you for agreeing to participate in the interview. As I mentioned, I would like to tape the interview. I will also make notes as we are talking both for my future reference and in cases where the tape may not be clear. As I told you, all of your responses will be held in confidence with the data reported in aggregate format thus assuring confidentiality. I plan to analyze and report the data with reference to the year of hire and the area of responsibility. I am interviewing nineteen faculty members and five administrators selected by random sample.

I am going to share with you the interview protocol. As you can see there are only four questions, each of which is open-ended. I am dealing with your perceptions of changes in structure and management at the Academy and therefore I realize I am dealing with twenty four different perceptions and thus twenty four different realities. I have included under each question areas of possible change that you may have witnessed or feel have impacted you or the Academy or your colleagues. They serve only as prompts; we can talk about each of them, some of them, or all of them. They may not be all inclusive, therefore we can talk about any other area that you believe is important. If you do not have any questions, we can begin the interview.

The first question is, over the past four years the management and structure of the Academy has changed. What changes have you witnessed and what are your perceptions of the impact of these changes on the Academy?"
Appendix C continued

The second question is, how have the changes in management and structure affected your professional growth and development as a member of the Academy community:

The third question is, in your opinion, how have the changes in management and structure affected the professional growth and development of your colleagues:

The last question is, are there other questions relating to the Academy that affect professional growth and development that I should have asked? Please discuss these with me."
Appendix D

Initial Interview Protocol

Name: ____________________________
Position/title: ______________________
Hiring date: ________________________

The following questions comprise the interview schedule:

Area of Inquiry: Perceptions of changes in management and structure of the organization.

Question #1: Over the past four years the management and structure of the Academy has changed. What changes have you witnessed and what are your perceptions of the impact of these changes on the Academy?

Area of Inquiry: Perceptions of how changes in management and structure affected the professional growth and development of the respondent as an organizational participant.

Question #2: How have the changes in management and structure affected your professional growth and development as a member of the Academy community?

Area of Inquiry: Perceptions of how changes in management and structure affected the professional
growth and development of other organizational participants.

Question #3: In your opinion, how have the changes in management and structure affected the professional growth and development of your colleagues?

Question #4: Are there other questions relating to the Academy that affect professional growth and development that I should have asked? Please discuss these with me.
Appendix E

Excerpt from Senate Bill 730
The Comprehensive Illinois Educational Reform Package
1986

Article III

Section 1. Policy and Purposes.

It shall be the policy of the State of Illinois to provide excellence in mathematics and science education in order to nourish an informed citizenry, assure technological skills for the work force, and assist in the preparation of professionals to serve the interests of Illinois in such fields as engineering, research, teaching and computer technology. It shall further be the policy to enlist the support of the educational, industrial, and scientific communities in a cooperative effort to provide excellence in science and mathematics education. As a symbol of this cooperative endeavor, there shall be established the Illinois Mathematics and Science Academy to serve the people of Illinois as a preparatory institution and the school system of the State as a catalyst and laboratory for the advancement of teaching.

The primary role of the Academy shall be to offer a uniquely challenging education for students talented in the areas of mathematics and science. Both high school and college levels of instruction will be provided in order to assure appropriate linkage with higher education. Other programs deemed necessary to assure
Appendix E - Continued

the elements of a strong general education required of creative scientists will be provided.

The Academy shall also carry a responsibility to stimulate further excellence for all Illinois schools in mathematics and science. That responsibility may be exercised through any or all of the following means:

1. Stimulating curriculum development and revisions through the collaborative efforts of the interacting institutions involved in the Academy including universities, secondary schools, the industrial sector and national laboratories.

2. Providing preservice training sites for persons in preparation for the teaching of science and mathematics.

3. Hosting summer institute opportunities for Illinois teachers modeled after the successful National Science Foundation program prevalent in the 1960s.

4. Providing opportunities for exchanging teaching or faculty seats at the Academy for science and math educators in the elementary and secondary schools in this State.

5. Creating the opportunity and potential to link vocational programs, education for technology and employment programs to the work of the Academy.

6. Offering speakers and programs for teacher institutes and in-service training around the state.

7. Producing videotapes of lectures and experiments for use in the schools of this state.
Appendix E - Continued

8. Providing assistance in identifying necessary competencies to be incorporated in public school district graduation requirements.

Section 2. Establishment, Funding and Location

There is hereby created the Illinois Mathematics and Science Academy which shall be a residential institution located in the Fox River Valley in close proximity to the national science laboratories based in Illinois. The Academy shall be a pilot project, funded by State appropriations, private contributions and endowments. Minimal fees for residential students may be charged. The Academy may admit those students who have completed the academic equivalent of the 9th grade and may offer a program of secondary and postsecondary course work. Admission shall be determined by competitive examination.

Section 3. Board of Trustees

The Illinois Mathematics and Science Academy shall be governed by a Board of Trustees which shall consist of the following members:

1. Four ex-officio nonvoting members who shall be: the State Superintendent of Education; the Executive Director of the State Board of Higher Education; the Superintendent of schools in the school district which the Academy is located.

2. Three representatives of secondary education, one of whom must be a math or science teacher, appointed by the State Superintendent of Education.
Appendix E - Continued

3. Two representatives of higher education, one of whom must be a Dean of Education, appointed by the Executive Director of the Illinois Board of Higher Education.

4. Three representatives of the scientific community in Illinois appointed by the Governor.

5. Three representatives of the Illinois private industrial sector appointed by the Governor.

6. Two members representative of the general public at large appointed by the Governor.

With the exception of the initial appointments, the members terms of office shall be for six (6) years. At the first meeting members shall draw lots for appointments of 2, 4 or 6 year initial terms. Vacancies shall be filled for the unexpired portion of the terms by appointment of the officer who appointed the person causing such vacancy. The initial terms shall commence upon appointment and upon expiration of a term, a member shall continue serving until a successor is appointed. The Board shall select a chair from among its members who shall serve a two (2) year term as chair. Members shall receive no salary but shall be reimbursed for all ordinary and necessary expenses incurred in performing their duties as members of the Board.

Section 4. Powers of the Board

The board is hereby authorized to:

a) Accept donations, bequests, or other forms of financial assistance for educational purposes from any public or private person or agency and comply with rules and regulations governing grants from the federal government
Appendix E - Continued

or from any other person or agency, which are not in contravention of the Illinois Constitution or the laws of the State of Illinois.

b) Purchase equipment and make improvements to facilities necessary for the use of the school, in accordance with applicable law.

c) Adopt, amend, or repeal rules, regulations, and policies necessary or proper for the conduct of the business of the board.

d) Award certificates and issue diplomas for successful completion of programs of study requirements.

e) Select a Director who shall be the chief administrative officer of the Academy and who shall administer the rules, regulations, and policies adopted by the Board pursuant hereto. The Director shall also be the chief administrative officer of the Board and shall be responsible for all the administrative functions, duties, and needs of the Board. Until such time as the board selects a director, the State Superintendent of education shall serve as the chief administrative officer of the Board and shall be responsible for the duties of the Director as they relate to the Board. The State Superintendent of Education shall relinquish such administrative duties to the Director when such Director officially assumes his duties with the Board.

f) Determine faculty and staff positions necessary for the efficient operation of the school and select personnel for such positions.
Appendix E - Continued

g) Prepare and adopt an annual budget necessary for the continued operation of the school.
h) Enter into contracts and agreements which have been recommended by the Director, in accordance with applicable law, and to the extent that funds are specifically appropriated therefor, with other public agencies with respect to cooperative enterprises and undertaking related to or associated with an educational purpose or program affecting education in the school. This shall not preclude the Board from entering into other such contracts and agreements that it may deem necessary to carry out its duties and functions.
i) Perform such other functions as are necessary to the supervision and control of those phases of education under its supervision and control.
j) The Board shall delegate to the Director such of its administrative powers and duties as it deems appropriate to aid the Director in the efficient administration of his responsibility for the implementation of the policies of the Board.

In addition to the authorities granted herein and any powers, duties, and responsibilities vested by any other applicable laws, the Board shall:

1. Adopt rules, regulations, and policies necessary for the efficient operation of the school.
2. Establish criteria to be used in determining eligibility of applicants for enrollment. Such
Appendix E - Continued

criteria shall ensure adequate geographic, sexual and ethnic representation.

3. Determine subjects and extracurricular activities to be offered.

4. Pay salaries and expenses, including but not necessarily restricted to facilities, equipment, and supplies of the faculty and staff of the Academy out of funds appropriated or otherwise made available for the operating and administrative expenses of the Board and the Academy.

5. Exercise budgetary responsibility and allocate for expenditure by the Academy and programs under its jurisdiction, all monies appropriated or otherwise made available for purposes of the Board and of such Academy and programs.

6. Prescribe and select for use in the school free school books and other materials of instruction for children enrolled in the school and programs under its jurisdiction for which the General Assembly provides funds.

7. Prepare and adopt or approve programs of study and rules, bylaws, and regulations for the conduct of students and for the government of the school and programs under its jurisdiction.

8. Employ such personnel as may be needed, establish policies governing their employment and dismissal, and fix the amount of their compensation. In the employment, establishment of policies and fixing of compensation the Board may make no discrimination on account of sex, race, creed, color or national origin.
### Appendix F

**ACADEMY COURSE OFFERINGS**

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**ILLINOIS MATHEMATICS AND SCIENCE ACADEMY**

**Total Faculty and Administration Demographics**

**1986 - 1989**

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Appendix I

ILLINOIS MATHEMATICS AND SCIENCE ACADEMY
STRATEGIC PLAN

BELIEF STATEMENTS

WE BELIEVE THAT

• meaning is discovered, not prescribed.
• all individuals have equal intrinsic worth.
• all people have an innate desire to learn.
• the power of the human mind is the world's greatest resource.
• every individual is capable of both changing and bringing about change.
• trust is essential for any human relationship to prosper.
• the survival of global civilization depends primarily upon the quality of the education provided to all citizens.
• every person is responsible for his/her own choices and actions.
• belonging to a group implies subordination of self-interests to the common good.
• excellence is worth the effort, but not always worth the cost.
• achieving our vision of the future depends upon our willingness to sacrifice in the present.
• aversion to risk-taking stifles innovation and creativity.
• learning is an individual, life-long endeavor.
Appendix I - Continued

- valuable learning results from both failure and success.
- all adults share responsibility for the well-being of all children.
- the ability to discern and create connections is the essence of knowing.
- a good life is harmony among the emotions, the body, the intellect, and the spirit.
- the process of education is more than merely the accumulation of facts.

MISSION

The mission of the Illinois Mathematics and Science Academy, a community of scholars dedicated to intellectual exploration and discovery, is to develop leaders who know the joy of forging interconnections among mathematics, science, art, and humanities, and who by example and by instruction, inspire others to live in harmony with themselves, other human beings, and the physical world.

STRATEGIC POLICIES

WE WILL practice participatory management at all levels of the organization.

WE WILL NOT tolerate actions designed to diminish the self-esteem of any student or staff member.

WE WILL NOT compromise the quality of our programs and activities because of the lack of funding.

WE WILL employ and retain only those who embody the ideas, values, and purposes of the Illinois Mathematics and Science Academy.
OBJECTIVES

- All Illinois Mathematics and Science Academy students will demonstrate inventiveness and joy of learning.
- All faculty and staff will achieve and demonstrate inventions and creations.
- By 1995, at least one hundred individuals, companies, corporations or foundations will commit themselves to a long-term investment of financial and other resources in the Academy and its mission.
- By 1995, 25% of the elementary and middle schools in Illinois will use interdisciplinary learning modules developed or originated by the Illinois Mathematics and Science Academy faculty, fellows, and students that emphasize the interconnections among science, mathematics, arts, and the humanities.
- By 1994, the Illinois Mathematics and Science Academy student body will include at least 15% underrepresented ethnic/racial minorities, 45% female; and will reflect the population distribution of Illinois capable of completing the Academy’s graduation requirements.
- By 1995, 50% of Illinois’ K-12 school districts will have participated in the Illinois Mathematics and Science Alliance Programs.

STRATEGIES

I. By our practice, we will reconfigure the Illinois Mathematics and Science Academy curriculum by developing a concept-centered curriculum.

II. We will build partnerships with students, teachers, and staff in schools and colleges throughout Illinois that forge the interconnections among mathematics, science, the arts, and the humanities.

III. We will redefine student achievement and success.
Appendix 1 - Continued

IV. By our practice we will redefine teaching as facilitating discovery through interconnecting.

V. We will support and promote the personal and professional growth of each member of the Academy in his/her efforts to achieve our mission.

VI. We will recruit and maintain a culturally diverse student population composed of learners of exceptional talent in mathematics and science to include meeting the needs of students "at-risk".

VII. We will design a marketing plan that will secure the support and participation of a constituency of individuals, corporations, foundations, educational institutions, and governmental agencies committed to the Illinois Mathematics and Science Academy's mission.

VIII. We will implement an organizational structure that facilitates the realization of our mission and objectives.

IX. We will secure a financial commitment from the private sector.

X. We will integrate residential and academic life.
Appendix J

A DREAM BECOMES REALITY

The Illinois Mathematics and Science Academy, a dream of educators, scientists, and members of the business community just three years ago, is now reality. Created by the Illinois General Assembly in 1985 as a part of its educational reform program, IMSA will open its doors to students blessed with a special aptitude for science and mathematics and September, 1986.

The intellectual groundwork for the school was prepared during a workshop convened by Friends of Fermilab and the Corridor Partnership for Excellence in Education in December, 1983. Funded by the Illinois Department of Commerce and Community Affairs and a grant from Brooks McCormick, representatives from secondary schools, higher education, and research laboratories created the working papers for a residential school which would offer a program of challenge, acceleration, and enrichment in science, mathematics, and the humanities.

The plan for a new science and mathematics academy was proposed to Governor Thompson's Commission on Science and Technology and the Task Force on the Quality of Mathematics and Science Education in Illinois. The academy proposal was evaluated by these groups as a means of:

- delivering mathematics and science instruction of the highest quality to students with exceptional ability in these areas
- upgrading the teaching of mathematics and science in Illinois' secondary schools
- Signaling to the nation and the world that Illinois is committed to developing the human resources needed for economic leadership now and into the next century.

With the sponsorship of Senator Forest Etheredge (R-Aurora), legislation was introduced to bring the Illinois Mathematics and Science Academy
Appendix J - Continued

(IMSA) into existence. With the passage of Senate Bill 730 in July of 1985, the Illinois General Assembly officially created the academy as a part of sweeping educational reform for the state's system of schools. On October 16, 1985, Governor Thompson announced the names of seventeen people who would become the academy's first Board of Trustees and work began on the multitude of tasks which must be accomplished in preparation for the academy's opening in September, 1986. The Board of Trustees includes:

James Pearson (President)
President, Aurora
Aurora Industries

Jack McEachem, Jr. (Treasurer)
President
Wayne Circuits Incorporated

Dr. Martin Abegg
President
Bradley University

Dr. Leon Lederman
Director
Fermi National Laboratory

Dr. Walter Massey
Vice President
Argonne National Laboratory

Barbara Schmulbach
Teacher
Carbondale Community High School

Jesus Sosa
Principal
Clemente High School
Chicago

Ex-officio Members

Ted Sanders
State Superintendent of Education

Richard Wagner
Executive Director
State Board of Higher Education

Dr. Stephanie P. Marshall
Superintendent, Batavia Public Schools
Batavia, Illinois

Sheila Griffin (Secretary)
Marketing Executive
Motorola Incorporated

Dr. Dennis Gooler
Dean College of Education
Northern Illinois University

John Marion
International Brotherhood of Electrical Workers
Aurora

Dr. Anthony Sadowski
Vice President
NALCO Chemical Company

Elsie Scott
Teacher
Mattoon High School

David Pierce
Executive Director
Illinois Community College Board

Gary Jewel
Superintendent of Schools
Aurora West School District #129
Appendix J - Continued

Under the direction of the Board and F. Borden Mace, first principal of the North Carolina School for Science and Mathematics and interim director of IMSA, work has begun in earnest. A major task, just completed, was the selection the North Campus high school building in Aurora West School District #129 as the site for the academy. This $12 million innovative structure was available because of declining enrollment.

Working committees of the Board have also been hard at work on the academy’s academic, student life, and housing needs. The Instructional Programs Committee has completed a curriculum guidebook which outlines the school’s instructional goals and programs, including course requirements and descriptions. The school’s three year program will allow entering students who have reached the equivalent of sophomore standing in high school to graduate with at least sophomore standing in the university. Along with an accelerated program of challenging and enriched courses in science and mathematics, students will be expected to complete a rigorous and stimulating program in the humanities. This will include courses in the social sciences, English, foreign languages, and the fine and performing arts. The academic program will also feature a mentor relationship between students and research scientists at government and industry laboratories, as well as an extensive array of independent student experiences and interdisciplinary seminars. Dr. Cecily Selby, New York University and Massachusetts Institute of Technology, has consulted with this committee on the special needs of gifted children which must be reflected in the Academy’s curriculum design.

Since the academy will be public residential school, the Board’s Committee of Student Support Services is currently designing the structure for student life on the campus. With the help of parents, counselors, and Dr. Bobby Alosta, Director of the Louisiana School for Mathematics, Science and the Performing Arts, plans are underway to create an environment in which the social/emotional needs of high school students can be met; especially the transition from life at their local high school to life at the academy.

Providing housing for students at IMSA is also a major task facing the Board of Trustees and academy staff. Plans are in the process of being completed by the Committee for Building/Facilities and the architectural firm of Philips, Swager/Kleb and Associates (Aurora, Illinois) for the creation of two residential settings for students. Each will be home to about one hundred young people and include apartments for residential
Appendix J - Continued

counselors as well as space for social events, quiet study, and relaxation. Each room will be equipped for access into a campus wide computer network. Additional buildings will be added over the next three years until housing for approximately one thousand students is completed.

On March 7, 1985, student application packages were distributed to all the high schools in Illinois. This begins the process, designed by the Board's Student Selection Committee and Dr. Clifford Wing, Duke University, for selecting students from Illinois who will enter IMSA in September. Student selection will be based upon SAT scores, grades at the previous school, and rankings/nominations by past science and mathematics teachers. The academy's student body will mirror the diverse ethnic, geographic, and socio-economic population of Illinois. Students will receive their education at the academy without charge for housing, tuition, board, or books.

To actually select students, a Student Selection Committee with membership from associations and organizations concerned with higher education, gifted students, high school guidance programs, and science/mathematics education is being assembled. They will use the selection procedures developed by the academy staff, soon to include a Director of Admissions, and Dr. Wing to pick the academy's graduating class of '89.

The Board's Personnel Committee has begun developing guidelines for the recruitment of administrators, faculty, and staff. Documents are being created which communicate the details and potentials available to professionals interested in helping develop Illinois most precious resource - the human mind.

At the beginning of March, the Board's Legislation/Finance Committee completed meetings with the Governor's staff and legislators which resulted in the passage of a supplemental appropriation for $5.4 million. This money is to be used for alterations and repairs to the Aurora facility and for building the academy's first two dormitories. The committee has also begun preparing a budget for the 1986-87 fiscal year.

Acquiring funds from individuals, corporations, foundations and other sources is the job of the Committee for Private Support. A fund has been created with "not for profit" status which will be the source of support for academy programs which extend instruction to the cutting edge of excellence.
The process which began as a dream of educators and scientists concerned with the improvement of mathematics and science education in Illinois is nearing its first major goal - the selection of the academy's inaugural class. Much has been accomplished in a very short time. But the mission has just begun.