THE CHANGE DELINEATOR THEORY: A TEST WITH A CASE STUDY

OF AN INNOVATION IN SCHOOL-COMMUNITY RELATIONS

by

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(ABSTRACT)

The Change Delineator Theory, a theory of change developed by the researcher, is proposed and tested for validity against an identified case of change. In the theory's propositions, the researcher describes the roles individuals play in the process of change and reform, and suggests how these roles may also impact the process of change as it occurs on organizational and societal levels. By proposing this perspective on the process of change, it is the intent of the researcher to assist leaders in schools and other organizations in becoming more knowledgeable about the phenomenon of change as it affects individuals, organizations, and societies. The Change Delineator Theory may also provide leaders with additional insights that could be useful in determining whether their organizations' policies, practices, and structures support or discourage change processes.

In Change Delineator Theory, the researcher proposes that all persons involved in the process of change think and consequently behave in one of four primary modes called conceptual domains. These domains are: Creators, Translators, Innovators, and Practitioners. All persons have within them, to

one degree or another, these four capacities. The environment in which an individual is functioning determines to a large degree which of these four domains will manifest itself at any given time. The four conceptual domains may also be used to describe how change tends to occur on organizational or societal levels. The researcher suggests that leaders have the power to establish organizational structures that support change by enabling persons in their schools or organizations to act more frequently out of their creator and innovator domains, or conversely, that hinder these activities through use of autocratic leadership styles or those that support maintenance of the status quo.

The theory is tested by applying its propositions to an identified case of change in school-community relations known as the Computing Seniors Program. A case study approach is utilized to determine whether or not the theory has any validity when used to describe the roles people played in this case of change.

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1. GENERAL INTRODUCTION

1.1 The Context of Change in Education

On the precipice of the millennium, as we reflect back on the myriad of so-
cial, economic, political, and technological events that transpired during the
past twenty years, significant and rapid changes have impacted virtually all
segments of our society and the world. Among countless changes, the Cold
War ended, causing many of the major powers to downsize their militaries.
Communism, at least for the time being, no longer appears to be a viable politi-
cal alternative for most nations. World energy prices remained fairly stable and
even declined during the past two decades. In the latter half of the decade of
the nineties, the cost of gasoline, diesel, and heating oil dropped to their lowest
levels in twenty years. The stability and relatively low cost of energy prices
played a major role in reducing and controlling inflation in many of the indus-
trialized nations, enabling the expansion of the free marketplace and capitalism
in the global economy. Perhaps most significantly, the economies of the west-
ern nations shifted from operations based primarily on Industrial Age knowl-
edge, skills, and processes to those of the Information Age (Evans, 1996; Ful-
lan, 1991; Mehlinger, 1990; Schlechty, 1990). As a result, much of the world
and especially the United States, has experienced an era of prosperity, reduced
unemployment, and record level stock market prices. During this same period
of time, our nation's public schools have also been challenged by the unprece-
dented changes in society. Schools continue to be faced with many and varied
pressures that seek to alter public education as it has been known for

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generations. Additional challenges are likely to arise as the rate of change continues to escalate, producing an increasingly pluralistic and complex society (Fullan, 1991). Four of these changes are particularly relevant to this study due to the dramatic affect they have had and will continue to have on schools throughout the nation.

The first major change affecting schools has been the *technological* and *information revolution.* This change was brought about by a shift in the western world's dependency on industrial era businesses and manufacturing to those of the Information or Knowledge Age (Drucker, 1995). "Information has become the new source of wealth, replacing cheap energy and accessible raw materials that supported the Industrial Revolution" (Mehlinger, 1995, p. 7). The information revolution was spawned by the development and wide-spread application of integrated circuits and other advanced micro-electronics, universally accessible telecommunications, and in particular, the personal computer.

Since the early 1980s, the personal computer has permeated and impacted virtually every segment of society, including the public school. The geometric escalation of computing power and processing speed, combined with a corresponding rapid decline of the cost per megabyte of memory, has made an incredible amount of processing power, information, and knowledge available to citizens from all walks of life and of all ages, from young children to senior citizens. "Information technology is one of the great enabling technologies. Like electricity and the automobile, its impacts are important in themselves and more important for the waves of change they bring about" (Coates & Jarratt,

1992, p. 9). As a result of the technological revolution of the last quarter of the Twentieth Century, a never-before-experienced explosion in the advancement of knowledge and the availability of information has occurred that has rapidly increased the rate of change occurring in almost every institution of society (Drucker, 1995; Schlechty, 1990; Senge, 1990; Shane, 1987)[1].

"Information Age technology is the single greatest factor affecting the way we live; it cannot help but alter the way we conduct schooling", claimed Mehlinger (1995, p. 21). Over the last ten to fifteen years, information age knowledge, skills, and abilities have become virtual requirements for success in the work place and have resulted in additional pressures being placed on public schools to adapt to the new order. "This is far more than a social change", stated Peter Drucker (1995), "It is a change in the human condition....Education will become the center of the knowledge society, and schooling [will be] its key institution" (pp. 233-234).

The second major change may be called *the general disillusionment and dissatisfaction* of the American people with what they believe to be the quality and purpose of education their children receive in the public schools (Barth. 1990). The decades of the 1970s and 1980s seemed to bring to light evidence of a general decline in student learning as measured by standardized achievement tests, producing dissatisfaction among many Americans in their system of public education. Naisbitt (1982), author of a best selling book in the early 80s

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[1] Knowledge was predicted to be doubling every 24 months by 1992 (Shane, 1987), and is thought to be doubling every 18 months in 1999 (Thornburg, in Sistek-Chandler, 1999).

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entitled *MegaTrends,* cited evidence of this: SAT scores declined linearly from a composite total of 969 in 1965 to an all-time low of 894 in 1979; on a 1979 Gallup Poll respondents "…expressed very little confidence in the schools" (Naisbitt, 1982, p. 142). Naisbitt emphasized that it is important to recognize that the dissatisfaction of the American public with their schools began in and continued through the decade of the 70s. Prior to this time he pointed out, before the full ramifications of the technological revolution became so apparent, schools were pretty much in sync with the needs of an industrially based economic system.

The disillusionment and dissatisfaction of the American people with public education was brought to a head with the issuance of a number of reports in the early to mid 80s that generally indicted the quality of American public education from kindergarten through the college years. It seemed like anyone and everyone who could catch the attention of the media had something negative to say about the state of educational affairs in the country at that time. Many government agencies and boards issued reports criticizing the quality of public education. Among some of the more notable are: *Action for Excellence* (Education Commission of the States, 1983); *Educating Americans for the 21st Century* (National Science Board and the Commission on Precollege Education in Mathematics, Science, and Technology, 1983); *The Failure of Our Public Schools: The Causes and Solutions* (National Center for Policy Analysis of the University of Dallas, 1983); *Transforming American Education: Reducing the Risk to the Nation* (U.S. Department of Education, 1986); *Ventures in Good*

Schooling (National Education Association, 1986); and perhaps the most well known, *A Nation at Risk* (National Commission on Excellence in Education, 1983).

With the issuance of these reports, significant concern, scrutiny, and aggressive rhetoric from politicians, business leaders, and the general public began to be focused upon the institution of the public school. Many people felt strongly that our schools were failing in their responsibility to properly educate the nation's children or to provide them with the basic skills needed to be competitive workers in the global, information-based marketplace. Minzey and Le-Tarte (1994) suggested that the root cause of this discontent with the country's educational system was

> the fear that our schools are not good enough to meet these very new and different needs, and if our schools fail...we fail. Our citizens are struggling to define the specific changes that need to be made, but they share a sense that a mismatch exists; a mismatch between what society needs and what our schools are providing. (p. 158)

Others debate the accuracy and validity of much of the negative data, information, and political rhetoric of those alleging the poor quality of public education in the United States. The authors of such works as*: The Manufactured Crisis* (Berliner & Biddle, 1995); *Setting the Record Straight* (Bracey, 1997); *Exploding the Myths* (Schneider & Houston, 1993); *Telling the Truth About America's Public Schools* (American Association of School Administrators, 1996); and *The Myth of Public School Failure* (Rothstein, 1993) take issue with

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politicians and business leaders who have been decrying the quality of our educational programs. Despite evidence to the contrary as cited in these books, many politicians, business and industry leaders, the general public, and even some educators continue to believe that the American educational system is failing to produce sufficient numbers of young people who have the skills needed to compete successfully in the information-based global economy (Bracey, 1997; Long, 1991; Shane, 1987).

Interestingly, recent Phi Delta Kappa/Gallup polls have shown that the general public, and especially parents with children in public schools, think that the schools their own children attend are pretty good. In 1998, 85% of the responders rated their schools an "A", "B" or "C"; only 13% rated them "D" or "F". At the same time, people believe that the other schools in the country are not as good as their own. In the same survey 68% of the people rated other schools an "A", "B", or "C" and 17% rating them a "D" or "F" (Rose & Gallup, 1998). "The trends established by this series of questions have been consistent. They make it clear that the closer people are to the public schools, the higher their regard for them" (Rose & Gallup, 1998, p. 46). Rose and Gallup commented that since 1974 their survey has consistently demonstrated that the general public does not believe that their schools are in as bad a shape as national media, corporate, and political rhetoric would have us believe.

Another measure frequently used to assess the quality of the product of our country's public schools, although not designed nor intended for that purpose, are S.A.T. scores. By the early 1980s combined math and verbal S.A.T. scores

had rebounded from the all-time low cited by Naisbitt, (1982), averaging just over 1000 in 1994. They continued to rise in 1995 and crossed the 1010 point in 1996 (World Almanac Book of Facts, 1997, p. 255). According to the College Board, the scores reached 1016 in 1997, having gained 147 points over the 1965 scores, the year when the supposed downfall began. Despite these gains, we have not heard many accolades from politicians or the media about the increases in student achievement and presumably therefore, the improved quality of American education. The myths still seem to prevail. Elam, Rose and Gallup (1994) concluded,

> …*the general public has come to believe public education's critics regarding the state of the nation's schools*, [italics added] which have been blamed for everything from ignorance of geography to economic recession. Parents with children in school know better; a comfortable majority of them believe that the schools their children attend are improving. (p. 47)

So, whether the crisis in public education is real or contrived, it remains that in years subsequent to the publication of *A Nation at Risk* and similar reports, innumerable school reform efforts have been undertaken in an attempt to improve the way schools conduct the business of education. Many of these changes have focused on establishing higher academic performance and graduation standards, standardizing and aligning curricula, returning to teaching the basics, testing students for competency, increasing reliance on nationally normed standardized testing, developing alternative assessments, and evaluating teachers for competency. This trend continues today (Merz &

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Furman, 1997). Ironically, many of the aforementioned changes seem to be a throwback to what may have worked reasonably well during the former industrial era. Unfortunately, these may not be in harmony with the kinds of changes needed in schools that will provide students with the skills necessary for success in the Information Age (Schlechty (1990). The "system functioned well during most of the twentieth century…" concluded Mehlinger (1995), but "…the school system we now have, which was designed for another age, does not perform well under current circumstances" (p. 31).

The third major factor impacting public education, perhaps in part in response to the two just discussed, has been the national political movement away from centralized control toward *state and local self-determination and governance*. Naisbitt predicted in 1982 that the public's dissatisfaction with the federal government in general and public education in particular would result in the development of a variety of self-help responses to the perceived problems. The general public, business community, and special interest groups have become more active in and demanding about the governance and control of public education than it seems they were twenty or so years ago. The move towards increased local control is exemplified by the return to the states of many of the programs originally established, funded, and operated by the federal government, the development and spread of site-based management, and initiatives that increase parental choice such as charter schools and voucher systems. Increases in business partnerships, volunteerism, community concern and scrutiny over what goes on in schools are additional indica-

tors that the public is very much involved in the affairs, governance, and reform of public education.

Some people see the movement towards increased local control over school programs, curricula, and methods as a political effort by Christian fundamentalists, conservatives, or the socio-economically well-off to undermine public education for their own self-serving elitist interests. Arons (1997) bluntly suggested that the movement towards increased local control is anti-democratic, anti-intellectual, and anti-desegregation. Whether one believes the effort to increase local control is noble democracy at work or the outgrowth of discriminatory elitism (it may be some of both), the self-determination and governance movement has and continues to be a major factor in charting the course of school reform and change.

The final major change occurring in our society that is relevant to this study, one that will be having an increasingly dramatic impact upon all of society's major institutions and especially the public school, is *the aging of America*. With the leading edge of the so-called baby-boomers (estimated to be about one third of the population) entering their fifties, our nation is on the verge of a major demographic shift in its population unlike any seen during the Twentieth Century. The current emphasis on youth that pervades many of the social, economic, and political aspects of our culture will be displaced by those that favor the desires and needs of the aged. "There is no doubt…" stated Birren, "…that matters of adult development and aging must be high on the agenda of educational institutions for the decades ahead if we are to realize

fully the human-resource potential of America" (Peterson, Thornton, & Birren, 1987, p. iv). There will be more presented on this important aspect of our changing society in subsequent sections of this study.

As a result of these dramatic changes—the technological/information revolution, the dissatisfaction of many persons with the perceived quality of public education, the movement towards greater local control, the aging of America, as well as other changes that have occurred in our society during the last thirty years of the Twentieth Century—school leaders at all levels have been under intense pressure to bring about changes in public education.

Community leaders, parents, and educators have struggled with the issues of what, where, when, and how to change schools safely and appropriately to ensure that they remain viable and integral assets to their communities. As Goodlad (1984) wrote,

> We live in an era of rapidly expanding opportunities to acquire information but of constricting opportunities to reflect, engage in sustained discourse with others, and clarify our beliefs about the times and circumstances in which we live. If our schools need improvement in the basics, they need – perhaps more—a fresh examination of their role in a society undergoing rapid change. (p. 15)

Now, more so than ever before, school board members, superintendents, central office administrators, principals, and teachers need to have a thorough understanding of the phenomenon of change. "No one can escape change. The

age in which we live is changing so fast that we do not have time to adjust before more change takes place" (Lippitt, 1973, p. 37).

In turbulent times, effective school leaders will be those who are skilled in, among other things, the process of leading their constituencies into and through the changes and reforms that are likely to improve student learning and achievement. Their schools must be responsive and adaptive to ever-changing social, political, economic, and technological environments. Goldring and Rallis (1987) have labeled such schools *dynamic*. Dynamic schools are those that have learned how to respond proactively to the innumerable and discontinuous forces that are having an impact on them as they seek to improve, schools "that take charge of change" (p.23) rather than simply reacting defensively to or ignoring these forces. What follows is the story of one principal's journey into the realm of change and innovation and some of the lessons he learned along the way.

1.2 Purpose of the Study

It is the major purpose of this study to propose and validate a theory of change developed by the researcher known as the *Change Delineator Theory*. The Change Delineator Theory describes the roles individuals play in the process of change and reform, and suggests how these roles may also impact the process of change on organizational and societal levels. By proposing this perspective on the process of change, it is the intent of the researcher to assist school leaders (and perhaps leaders in other organizations as well) in becoming

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more knowledgeable about the phenomenon of change as it affects individuals, organizations, and societies. The Delineator may also provide leaders with additional insights that could be useful in determining whether their organizations support or discourage change processes. *Change*, as defined by Lippitt (1973), is

> …any planned or unplanned alteration in the status quo in an organism, situation, or process, and planned change as an intended, designed, or purposive attempt by an individual, group, organization, or larger social system to influence directly the status quo of itself, another [entity], or situation. (p. 37)

Change can be planned or unplanned; orderly or chaotic; evolutionary or revolutionary; micro or macro; personal, organizational, or societal. It can be of a short-term (fads) or a long-term (institutionalized) duration.

It is hoped that leaders in education who read this study will obtain new insights into the phenomenon of change and that they will gain greater knowledge and understanding of the dynamics, skills and methods needed to ensure successful reform or change in the context of their particular situations. Furthermore, the Change Delineator Theory may also provide some new insights into the general study and application of change processes for leaders in government, business, industry, human services, and other organizations.

To test the validity of the proposed Change Delineator Theory, a case study of an identified example of change in the area of school and community relations known as the Computing Seniors Program is conducted and analyzed to

determine if it contains any elements explained or predicted by the proposed theory. This is an appropriate use of case study, as such studies can be used to test, clarify, refine, or to develop theories (Merriam, 1988). The data generated from the case "…confirms or refutes the theory" (p. 58). If the Change Delineator Theory does explain or predict aspects of the Computing Seniors case, then there is an increased likelihood that there is some validity to the proposed theoretical model. If there does not appear to be any relationship between the identified case of change and the theory, then either this case just happens to not fit the proposed theoretical model (i.e. it may not be a bona fide case of change), or the theory may not in fact be an accurate description of the change process.

While a great deal of work and study concerning the process of change has already been performed, according to Dunphy (1996) "…the field is at an early stage of theoretical development. There is no one, all-embracing, widely-accepted theory of organizational change and no agreed [upon] guidelines for action by change agents" (p. 541). If this is true for the corporate world, how much more likely is it true for the world of public education? The theoretical perspective of the change process proposed herein may have both micro and macro applications and thus may be applicable to individuals as well as to groups and organizations.

Gaining an understanding of change will enable board members, administrators, teachers, parents, and others concerned with or involved in public education to be better prepared to cope with changes that will inevitably impact

schools and school systems. Whatever one's interest or role in public education, if he is interested in creating long-term change, "…an understanding of the processes that bring about this long-term change is critical" (Goodman & Dean, 1982, p. 227). Armed with this knowledge, educational leaders may be more capable of developing their own strategies and plans for implementing purposeful and positive changes in their respective schools. However, the reader should keep in mind that change occurs in any group or organization within the context of its unique history, environment, structure, demographics, and other factors. Like people, no two schools or the communities they serve are ever identical; therefore, the process of change will be different in each situation. Through study of a specific case of change some lessons may be learned that could benefit school leaders as they pursue changes in the unique context of their own schools.

In summary, the purpose of the study is to validate a proposed theory of change developed by the researcher known as the Change Delineator Theory. A case study that involves the creation, implementation, diffusion, and institutionalization of a change in school-community relations known as the Computing Seniors Program will be conducted. The case will be analyzed to test the validity of the theory.

1.3 Significance of the Study

1.3.1 Significance of Studying Change Theory

Whether it is real or just a general perception based upon political rhetoric and innuendo, it should not come as a great revelation to anyone who has kept abreast of the news and popular literature concerning the state of public education over the last twenty years that in the minds of many Americans our public schools are in trouble. It is commonly believed that our schools are not producing in sufficient numbers the kinds of graduates our country needs to be competitive in an information-based and highly automated global economy (Naisbitt, 1982; National Commission on Excellence in Education, 1983; Minzey & LeTarte, 1994; Schlechty, 1997). As a result, public schools are under tremendous pressure to make the kinds of changes (reforms) that will have a positive effect upon student learning and academic achievement.

Unfortunately, according to Barth (1990), Fullan & Miles (1992), Schlechty (1997), and Evans (1990), the majority of teachers and administrators have not been adequately trained to be agents of change, and many are at a loss for knowing how to implement a process of reform that will lead to success in this regard. Serious reform "…will never be achieved…," stated Fullan & Miles (1992),

> …until there is a significant increase in the number of people—leaders and other participants alike—who have come to internalize and habitually act on basic knowledge of how successful change takes place….No change would be more fundamental than a dramatic expansion of the capacity of

individuals and organizations to understand and deal with change. (p. 745)

Other voices echo a similar sentiment. "The risks involved with a lack of understanding…" of the change and reform process as it concerns public education, stated Cuban (1990), "…include pursuing problems with mismatched solutions, spending energies needlessly, and accumulating despair. The existing tools of understanding are no more than inadequate metaphors that pinch-hit for hard-hitting thinking" (p. 11). Evans (1996) suggested that "Few school administrators receive the regular training in organizational development and innovation that is common among business executives…," and as a consequence, "…many educational change efforts fail due to expectable problems that well-trained leaders would anticipate" (p. 4).

By providing educators with the perspectives of the change process suggested in this study, school leaders may more effectively anticipate, manage, and facilitate the process of change. As a result, they may be more capable of preparing themselves, their staffs, and their communities for the inevitable changes and reforms that must be implemented to successfully meet the emerging educational needs of a variety of publics, future citizens, and workers of a rapidly changing, globally oriented, technologically dependent, and aging society.

1.3.2 Significance of the Computing Seniors Case

as a Case of Change Worthy of Study

The Computing Seniors Program was created and first implemented in the researcher's school and quickly spread throughout his district. Within many of the district's administrators and teachers, it produced a change in perspective about school-community relations and the use of school equipment, facilities, and staff. While using school resources to serve the general public is not in and of itself a new phenomenon, the provision of such services to the elderly was new to the school personnel studied in this research.

Since the researcher had ready access to a large volume of information about the Computing Seniors Program, it was convenient to choose it as a rep-resentative case of change for the defined purpose of this study. Apart from it being a convenient case to study, the researcher believed that the Computing Seniors Program was a representative sampling of a case of change, and as such contained factors relating to change processes that were likely to be found in many other cases of change. In research, selecting a case for this reason is commonly referred to as purposive sampling (Leik, 1972). Purposive sampling according to Leik (1972)

> ...serves well as a way of selecting cases which probably display the main facts of the population without concern for the refinements of statistical generalization...Emphasis is on sorting out patterns...leaving generaliza-tion to depend upon subsequent examination of a broader set of cases. (p. 18)

There are secondary reasons why the Computing Seniors Program is a worthwhile case to study. Our nation will soon be entering an unprecedented period in its history. As they begin turning 50 years of age in massive numbers within the next few years, the so-called baby boomers (about one third of the population) is likely to dramatically alter the country's demographic, political, and economic landscape. On top of this, older people are living longer lives than have their predecessors. The "graying of America" as it has been called, will inevitably have a major impact on all of society's major institutions, and especially on public education. It is suggested that educational leaders begin now the process of expanding their vision and knowledge of just who is the public to be served in public schools before the full weight of this demographic change is pressed upon them.

As the population ages, an increasing number of people will not have school-age children. The needs, concerns, and interests of non-parents and senior citizens may far overshadow those of children and youth. Will members of an aging population, increasingly moving into fixed-income situations and faced with social, health, recreational, and general welfare needs of its own, want to spend precious tax dollars on public school programs and services for our nation's youth from which they may derive little or no direct benefit? Conner (1992) suggested that they may not.

It is imperative that educational leaders recognize and prepare for this major demographic shift in our country's population. To help maintain public schools as viable institutions in the communities they were created to serve,

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educators at all levels should be knowledgeable about forthcoming population changes and the subsequent implications an aging population holds for public education. Increasingly, school leaders will need to learn about the characteristics and needs of older persons and should consider establishing community-based educational programs and related services for non-parents and older people. It is suggested to the reader that if school systems do not develop such programs and services, they run an increasing risk of losing the political and economic support of a very large and powerful segment of the country's population that generally supported public education in its youth, but may not do so as it ages.

Do educational leaders think about these forthcoming demographic changes? Are they aware of the physical, intellectual, and social needs of the aged? Have any actually created and conducted in their schools educational programs designed specifically for older persons? Manheimer, Snodgrass, and Moskow-McKenzie (1995) concluded in their review of research and programs involving the education of senior citizens that "Education that involves older adults remains peripheral in most schools" (p. 33). The vast majority of public school leaders are so busy, their budgets are so tight, and they are under such pressure to improve the learning and academic performance of the K-12 population that most probably have not given much thought to the possibility of providing educational services to any other segment of the population, let alone to the elderly, who are not considered much of a priority at the present time. Manheimer et al. (1995) pointed out that there has been little systematic re-

search done thus far that has studied the emergence of educational programs for older persons:

> Until recently….little or no comparative research has been devoted to studying the types of organizations supporting the interests of older learners…or how organizations have developed infrastructures, policies, staffing patterns, and curriculum [for older learners]. And only recently have studies been published examining the trend toward greater participant leadership, community involvement, and the impact of these programs on host institutions. (p. 86-87)

In order for educators to be prepared for the impending and significant population changes and to establish, maintain, or increase community support from an aging citizenry, there is clearly a need to study, analyze, add to the knowledge base, and share information about the experience of those educators who have already been involved in the creation and provision of educational programs for older adults in a public school setting. "Lessons can be learned from educational organizations trying to meet the wants and needs of the new seniors" (Manheimer, et al., 1995, p. 110).

1.4 Research Questions

The general research question of this study is: Is the Change Delineator Theory helpful in describing the process of change as it occurred in the case of the Computing Seniors Program? More specifically: 1. How does the Change Delineator Theory explain aspects of the change(s) that occurred in the

case of the Computing Seniors Program?

2. What evidence, if any, is present in the case of the Computing Seniors Program that might indicate that any person's actions may have resulted from or were influenced by his or her functioning in one or more of the cognitive performance domains of Creator, Translator, Innovator, or Practitioner as described by the theory?

3. What is the history of the creation, implementation, expansion, and institutionalization of the Computing Seniors Program?

   a. Who was involved in the creation and implementation of the Computing Seniors program, and what did each do?

   b. How was the program funded and promoted?

   c. How did the program expand to other schools?

   d. Were any changes incorporated into the program as it expanded?

4. What characteristics or other factors can be identified that should be taken into consideration when creating and conducting an educational program designed to meet the learning needs of senior citizens in a public school environment?

5. What are the costs and benefits derived by a school from conducting the Computing Seniors Program?

6. What are the benefits derived by older persons from participating in the Computing Seniors Program?

7. How has the Computing Seniors Program helped to promote better relations among schools and the senior citizen and general communities?

1.5 Methodology

This study is somewhat atypical in format and procedure. It departs from traditional research formats in that it is a composite of several research approaches, with heuristic, case study, ethnographic, and inductive techniques utilized. It is a form of basic research in which the researcher is attempting to obtain "…the empirical data that can be used to formulate, expand, or evaluate theory" (Ary, Jacobs, & Razavieh, 1996, p. 26). If, through the systematic collection and analysis of data from an identified case of school change, the major components of the Change Delineator Theory can be shown to have validity, the researcher hopes to add to the knowledge base about the process of change as it occurs in individuals, organizations, and societies.

The section of the study that describes the Change Delineator is heuristic in style and approach. Such a construct is a description or "argument" that combines logical and empirical methods to provide possible explanations of what has been observed to "bring about the discovery of new meaning" (Merriam, 1988, p. 13) about observed phenomena. It is designed to stimulate thinking in others and to encourage them to find out more about the topic as a means of furthering investigation into a particular phenomenon (Ary et al., 1996). Furthermore, a review of previous research and the general literature on the process of change will help to establish the context and rationale for the proposed theory. Observation, experience, logic, inference, and common sense are the tools utilized in constructing and describing the theory.

After describing the Change Delineator Theory, it will be tested using a case study of the Computing Seniors Program. Data from a variety of sources from the case (see Appendices A- I) will be collected, tabulated, and subsequently analyzed to determine if any aspects of this case support or are predicted by the proposed Change Delineator Theory. According to Merriam (1988), qualitative case study lends itself well to the kind of research being undertaken herein, where the researcher "...is interested in insight, discovery, and interpretation rather than hypothesis testing....This approach [case study] aims to uncover the interaction of significant factors characteristic of the phenomenon" (p. 10). It should be kept in mind by the reader that it is not the primary purpose nor intent to use the case study to prove or to firmly establish the validity of the proposed Change Delineator Theory beyond reproach, but rather to demonstrate that there appears to be some validity to the theory in this, its early stage of development. Additional research is admittedly needed to more fully develop the theory and to build its credibility with students of change.

The review of the literature related to the case study of the Computing Seniors Program includes school-community relations and community education; demographics, long range forecasts, and implications for public schools of the aging population; and the physical and mental needs of senior citizens that must be taken into consideration when developing school-based instructional programs designed to serve this segment of a school's community.

Data for this part of the study were systematically collected and analyzed.

Sources of information include personal notes, memos, and artifacts produced during the creation and implementation of the first Computing Seniors class; fliers, brochures, and notes from planning meetings; evaluation documents written by senior participants after completing classes; interviews with the division superintendent, eight principals who had adopted and implemented the program in their schools, and twelve instructors who planned and conducted Computing Seniors classes and who may have modified the program from its original design (listed with specific details in Appendix C). Interviews were also conducted with seven seniors who participated in the program, and questionnaires were mailed to another 60 seniors, of which 37 were returned. Results from the all of the interviews were recorded and transcribed into a raw data matrix and utilizing the constant comparative method, a determination was made as to whether or not any trends emerged from the various data sources that would support the Change Delineator Theory. Appendices A-H contain additional methodological information that pertains to the relationship of the data sources and interview questions to the major research questions.

Once the Computing Seniors Program is thoroughly described, an analysis of the data is conducted using the *constant comparative method* (Maycut & Morehouse, 1994) to determine if this case contains any components of the proposed theory. Figure 1 provides the reader with a visual conceptualization of the flow of the study and the relationships of the various components of the study's major strands to stated general purpose.

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┌─────────────────────────┐
│  Creating a theory of   │
│  change based upon a    │
│ school leader's knowledge│
│ of and experience with the│
│   process of change.    │
└─────────────────────────┘
              │
              ▼
┌─────────────────────────┐        ┌─────────────────────────┐
│    Research questions   │        │ Research questions about the│
└─────────────────────────┘        │ Computing Seniors Program │
              │                    └─────────────────────────┘
              ▼                                  │
┌─────────────────────────┐                     ▼
│ Review of change process:│       ┌─────────────────────────┐
│      Chaos theory       │       │ Review of the literature on aging│
│      Hyper change       │       │                         │
│   Schools and change    │       │      Demographics       │
└─────────────────────────┘       │                         │
              │                    │  Why educators should be │
              ▼                    │  concerned with the aging of│
┌─────────────────────────┐       │     the population.     │
│ About theory development │       └─────────────────────────┘
│                         │                     │
│          The            │                     ▼
│ Change Delineator Theory │       ┌─────────────────────────┐
│                         │       │ Story of the creation, imple-│
│        CREATORS         │       │ mentation, and expansion of the│
│      TRANSLATORS        │       │ Computing Seniors Program │
│       INNOVATORS        │       └─────────────────────────┘
│     PRACTITIONERS       │                     │
└─────────────────────────┘                     ▼
              │                     ╱─────────────────────────╲
              ▼                    │ Analysis of the case study to│
   ╱─────────────────────╲        │ determine the validity of the│
  │  Test of the theory:  │       │  Change Delineator Theory:│
  │  Does the theory help │◄──────│  Theory validated?  Y or N│
  │ to explain what hap-  │        ╲─────────────────────────╱
  │ pens in an identified │                     │
  │   case of change?     │                     ▼
   ╲─────────────────────╱        ┌─────────────────────────┐
              │                    │       Areas for         │
              ▼                    │     future research     │
┌─────────────────────────┐       └─────────────────────────┘
│ Case study of a change in│
│ school-community relations:│- - - - ┐
│   Computing Seniors     │- - - - -┘
└─────────────────────────┘
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Figure 1: Conceptual framework of the study components.

2. CONCEPTUALIZING THE PROCESS OF CHANGE

2.1 Introduction to the Change Process and Chaos theory

"Chaos is the law of nature. Order is the dream of man."

Wallace Stegner

One of the most popular and financially successful movies of all time is based upon the best selling book by the same name, <u>Jurassic Park</u>, written by Michael Crichton (1990). The success of his book is due to the plausibility of the main idea, due in part to Crichton infusing the fictional aspect of the story with elements of scientific fact and theory. One of these is known as *chaos theory*. Basically, this is a scientific view of the natural world that proposes that there are no absolutes, that we cannot predict with certainty how any natural or man-made systems will function or perform.

Seemingly minor, almost imperceivable fluctuations or variations in a system can ultimately produce major changes (Gleick, 1987; Gregersen & Sailer, 1993). Gleick stated that in the field of study on chaos, this is commonly known as a "sensitive dependence on initial conditions" (p. 8). As a result, all systems will eventually break down, or unforeseen factors will enter the picture making the end results unpredictable to some degree no matter how carefully planned or controlled. Crichton uses this concept adeptly in his book as the geneticists attempt to master evolutionary biology in their efforts to create and control dinosaurs, thus adding the element of chance, suspense, and surprise that keeps audiences on the edge of their seats. Of course, the story centers

around the chaos and the resultant adventure that follows an unforeseen act by a desperate person, despite the "spare no expense," best intentions of the park owners and scientists to create and maintain a well-planned, totally controlled, closed system.

At the December, 1995, Virginia ASCD conference, Michael Fullan shared his insights into the change process as it affects public education. In his presentation entitled "Managing the Change Process," he offered a perspective of the magnitude of the difficulties and problems schools face today that came straight out of the scientific notion of chaos theory. In essence, Fullan was cautioning education leaders that no matter how carefully we plan for and involve others in the change process, we need to know and recognize that the unanticipated is going to eventually happen as there is no such thing as an absolutely closed, controllable, and predictable system. He suggested that educators should develop a mind set that anticipates the future and the unforeseen so that they might be better prepared for and more adequately cope with changes that will inevitably occur in their schools and communities.

In their application of chaos theory to social systems, Gregersen & Sailer (1993) pointed out that "…it is possible for nearly identical entities embedded in identical environments [such is the case for many public schools] to exhibit radically different behaviors, even when the underlying systems are extremely simple and completely deterministic" (p. 777). Educational leaders that do not recognize or understand the potential the chaos factor poses for a school's or school system's day-to-day operations increase the likelihood that they may be

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is setting themselves up for difficult challenges, unanticipated problems, and even the possibility of failure.

2.2 Hyper Change

"A new civilization is emerging in our lifetime, and blind men everywhere are trying to suppress it."

Alvin Toffler, 1980

Fullan's comments and his writings stimulated my thinking on this topic and eventually led to the development of my desire to study the change process. I began thinking about why it seems that so many people are threatened by, easily succumb to, and are defeated by changes in our social, economic, educational, natural, or other environments, while others seem to adapt quite well to and may even thrive under similar circumstances. Resistance to change appears to be a universal characteristic of human beings. Why do people seem to resist change as if they would fall off the edge of the earth if they ventured into dark waters of the unknown? With the change process affecting so many aspects of our daily lives, why are people from all levels of the social strata not taught in our nation's schools how to prepare for and cope with this inevitable aspect of everyone's life? "Why do we prepare people for a predictable, controllable world when in fact they will face a life filled with uncertainty and ambiguity" (Caine & Caine, 1997, p. 16)? Leaders in all walks of life, and especially those in the field of public education, need to understand change and must develop the skills necessary to help people prepare for and adapt to

the changes that will inevitably occur in their personal lives as well as their businesses, organizations, cultures and societies (Fullan, 1991; Schlechty, 1990; Evans, 1996; Zakariya, 1996).

In many respects groups, organizations, and institutions, products of the human mind, are similar to living organisms trying to cope with, survive, and reproduce in an ever-changing environment. For example, Darwin's Theory of Evolution, one of the foundation theories on biological change, has had a great influence on world economics, politics, and warfare (e.g. "only the strong survive"), and pervades many aspects of our culture even today. "Organizations…are conscious entities with all the characteristics of a living system," suggested Brown and Moffett (1999). "They have personalities, values, patterns of interaction, structures, internal processes, and self-referencing pathways" (p. 28). In the biological realm, in order to survive over the eons, life must be able to adapt to changing circumstances, and this seems to hold true for organizations as well (Dunphy, 1981). However, unlike in the natural world, Dunphy suggested that

> …the peculiar problem of organizational adaptation today is that
> the accelerating rate of change and the difficulty of making accurate future
> predictions combine to reduce "lead times" dramatically….Therefore, the
> effective management of change depends increasingly on understanding
> the larger social trends and forces that affect organizations. (p. 1)

The school, as a human creation, is very much subject to these same forces and influences.   What is needed, suggested Garmston and Wellman (1995),

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and Evans (1996), are schools and school districts that have learned to be anticipatory, adaptive, and self-renewing. Senge (1990), a proponent of "systems thinking," would call such a school (and other organizations as well) a "learning organization"—one that is "continually expanding its capacity to create its future" (p. 14).

While many changes in modern society seem to be occurring at a revolutionary pace, the school as a social institution tends to be more evolutionary. For the last 150 years it has sought to remain in the safety and security of the social, political, and economic "ecological niche" in which it has previously succeeded, survived, and reproduced (Counts, 1932; Schlechty, 1990, 1997; Toffler, 1970). Certainly, one would have to admit that there have been changes in schooling over the past two centuries—the typical school of today is a far cry from the one-room school house—but the changes that have been made are for the most part structural. Reforms may come and go, wrote Cuban (1990), but the school remains a fairly stable entity amid such changes. Most reforms

> …get implemented in word rather than deed, especially in classrooms….
> Seldom are the deepest structures of schooling that are embedded in the
> school's use of time and space, teaching practices, and classroom routines
> fundamentally altered even at those historical moments when reforms seek
> those alterations as the goal. (Cuban, p. 9)

Schools are organizations designed and established to express and maintain the ideologies of the society that created and maintains them, the so-called status quo (Cuban, 1990, Schlechty, 1990). We have a deeply rooted conser-

vative tendency to view and assimilate reality according to our existing struc-

tures, claimed Evans (1996), and it is therefore not surprising that our institu-

tions should also generally hold a similar psychological perspective.

> What is surprising is not that institutions resist innovation [and change]
>
> but that anyone should expect them to welcome it….For institutions of all
>
> kinds, just as for individuals, stability, far more than change, is the
>
> rule….The "forces of conservatism" support the status quo and discourage
>
> both dissent and innovation [change]. (Evans, p. 45)

The postindustrial society we live in today exists in a rapidly changing and

shrinking world, an era of virtually instantaneous communications, high-speed

travel, electronic entertainment, computers, automation, and seemingly over-

night obsolescence—an era of hyper-change (Toffler, 1970, 1980). "Humankind

[now] has the capacity to create far more information than anyone can absorb,

to foster far greater interdependency than anyone can manage, and to acceler-

ate change far faster than anyone's ability to keep pace" (Senge, 1990, p. 69).

Jobs, careers, and many personal relationships seem temporary today

when compared to those of a generation ago. "Changes we have experienced in

the past are not the same as the change we are experiencing now" (Minzey &

LeTarte, 1994. P. 155). Events like the Oklahoma federal building bombing in

April, 1995 remind us all too vividly that violence and the crazed acts of fanat-

ics can change or destroy many lives instantaneously, without warning and

often for no apparent reason. In the fast-paced, electronically driven Informa-

tion Age, everything seems to be much more temporary than it has ever been

before. There appears to be little stability in the lives of large numbers of people, young and old alike. As Alvin Toffler (1970) predicted in *Future Shock*, these changes are continuing to occur at an explosive rate, and many people, institutions, and especially schools are experiencing the fallout and consequences of being inadequately prepared to cope with such a rate and expanse of change.

For most of the so-called Industrial Age (roughly from the 1870's to the 1960's), having the ability and temperament to plan for and work towards long-range goals gave a person a distinct economic and social advantage. For many Americans during this period, (especially white males), patience, hard work, preparing and saving for tomorrow frequently led to a reasonable level of economic security and success. There was sufficient time to learn, to explore new ideas, and to gain experience that could be depended upon to be useful for the next 20 or 30 years—a working lifetime. While change was indeed occurring, its rate was relatively slow and the basic knowledge and skills most people needed to be successful participants in an industrial and manufacturing society remained fairly consistent and manageable. Minzey and LeTarte (1994) labeled this kind of change "incremental change…change that builds upon previous change but doesn't modify basic structures" (p. 155). Times were relatively stable, and stable people working for their long-range good usually were able to achieve a degree of success and security (Handy, 1990). During the industrial era it was not uncommon for the average worker to spend 30 or 40 years working for the same company, often doing the same thing day in and

day out. "Mass education was the ingenious machine constructed by industrialism to produce the kind of adults it needed" (Toffler, 1970, p. 400), and most schools were highly successful in producing workers who had adequate skills and training needed by business and industry for the first two-thirds of the 20th Century. Up until the late 1950s and early 60s, schools were generally considered as doing a pretty good job of preparing students to be competent, obedient, and functional citizens and workers of the industrial society (Minzey & LeTarte, 1994; Naisbitt, 1982; Schlechty, 1990, 1997; Toffler, 1980).

In all likelihood, the world around us will never again be as stable and predictable as it was in the former agrarian and industrial eras. The world today is one of change, and extremely rapid change at that. To be successful in a society where hyper-change is the norm, people will have to learn to cope with, understand, prepare for, and adapt to a constantly and rapidly changing social and economic environment. "Those who are always learning are those who can ride the waves of change and who see a changing world as full of opportunities rather than of damages…" stated Handy (1990) "…They are the ones most likely to be the survivors in a time of discontinuity" (p. 56).

Because so many aspects of our society, the world of work, and our nation's place in the global arena are changing at such a rapid pace, today's public school is under tremendous and increasing pressure to adapt and change to better meet the emerging economic and social needs of individuals and society. However, the institution of the public school is frequently and increasingly criticized for having failed in this regard, especially since the early 1970s, and

has been charged with lacking the ability to keep pace with and adapt to the emerging needs of the society it serves (Evans, 1996; Fullan, 1991; Minzey & LeTarte, 1994; Naisbitt, 1982; Schlechty, 1990, 1997). "America's multiple educational systems are its major long-term mechanism for shaping the future, but this infrastructure for human resource development has remained static rather than shifting its mission as the societal environment has changed" (Dede, 1992, p. 104). As a result, innumerable and often repeated attempts at changing the public school have become almost epidemic, prompting Evans (1996) to call such measures a "carousel of reform" (p. 84).

Like an organism that has found a successful and comfortable ecological niche, the school as an institution has tended to resist change, having been originally designed to pass down the knowledge, culture, and history of generations past (Cuban, 1990; Caine & Caine, 1997; Minzey & LeTarte, 1994; Schlechty, 1990). And for most of its 150 or so years of existence, it has done a pretty good job of accomplishing this goal. Unfortunately, in many school districts the structure of the school day, curricula, teaching practices, and the organization of many schools are still heavily locked into an instructional philosophy and design that, while necessary and reasonably successful in an agrarian and manufacturing era, are no longer adequately meeting the needs of a technologically and informationally based global economy (Evans, 1996; Mehlinger, 1995; Schlechty, 1990, 1997; Toffler, 1970, 1980). Minzey and LeTarte (1994) concluded:

As educators, we represent a large, cumbersome, and often very

bureaucratic system designed to meet the education needs of a society that no longer exists. While we have made incremental change over the past 150 years, incremental change will no longer work….Our schools and our educators are not well equipped to make this change. By and large, as individuals and organizations, educators have been the protectors of the status quo. (p. 159)

"Once, a school leader was invariably its principal, expected to maintain a status quo that looked backward, conserving and perpetuating a stable knowledge base for use by society's elite," stated Cushman (1997) of the Coalition of Essential Schools. "Now, we ask schools to educate a much broader population for a swiftly changing global society with a ballooning information base" (p.1).

"American public schools are better at doing what they were designed to do than ever before…" stated Schlechty (1997). "…Unfortunately, what the schools were designed to do is no longer serving the needs of American society" (p. 11). Dede (1992) cautioned that

America does not have much time to understand and shape what is happening; the Industrial Revolution took more than a century to reach fruition, but global economic competition and the pace of technological advance will drive the next transformation much more quickly, over just a few decades. Unintelligent workers and nations with obsolete economic approaches will face difficult times. (pp. 109-110)

If the institution of the public school does not adapt to meet the emerging needs of our culture, it may very well cease to be a viable asset to our society and may become extinct in its present form (Minzey & Letarte, 1994). Reform movements such as voucher systems, charter schools, magnet schools, privatization, and other school change efforts abound. They are "mutations" that are challenging the natural order of schooling in America, vying for the public's confidence in their effort to produce a better adapted system of public education. If they are stronger and more successful in meeting the needs of society, their "species" may be more likely to thrive and reproduce, and public schools as we know them today will lose political and economic support, becoming relics of the past (Cuban, 1990; Schlechty, 1997). "When we understand that schools serve a conservative function in our culture rather than a transforming one, it is easy to see why our visions of school are so limited and why schools find it so hard to change" (Mehlinger, 1995, p. 21). One can only speculate about what might happen to our nation's democracy and our way of life should the free public school, despite all of its problems, becomes extinct as a result of its inability to cope with a rapidly changing society.

One response to the hyper-changes that have occurred and are continuing to occur in American society has been the profusion of books, articles, theories, and suggestions on the topic of change, much of which has originated in the fields of business leadership, management, and organizational development (Mehlinger, 1995). Many of these (e.g. program planning and budgeting, managing by objectives, total quality management, organizational development,

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systems thinking, and learning community, to name but a few), have been or are currently being touted as *prescriptive solutions* to what ails public education. The sheer volume of this information can be overwhelming and difficult to keep up with for leaders in all walks of life, let alone for those who work in the schools (Evans, 1996). At the root of such thinking "…is the analogy of the marketplace…" stated Cuban (1990), "…where competition for private goods and services leads to both consumers and businesses profiting" (p.6).

Corporate leaders, politicians, and the general public seem to believe that if something works well for business and industry, then it should also work well in the schools. However, the terminology, theories of change, and implementation strategies designed for and used in the world of business and industry that are being proposed as potential solutions to the problems facing public schools may or may not necessarily be the proper course of action for educational leaders to pursue. "We haven't learned how leadership concepts developed in non-educational spheres apply to schools" (Evans, p. 1996). The contexts, raw materials, products, circumstances, political pressures, and other challenges facing a typical public school are in fact very different from those of a typical business or industry. Ironically, it seems that just as popular management concepts begin to wane in business and industry, and whether or not they have any relevance to the context of schooling, they are brought into the arena of public education with missionary zeal. Zealots of each new approach often proclaim theirs to be *the* reform that will become the savior of public education.

In addition to trying to make sense out of the proliferation of information on change, many principals and other school leaders find it difficult to determine how to best use this information in *the context of their own unique school situation* when trying to develop and implement strategies that might result in positive and enduring school reform. Time and time again observers of educational reform efforts have seen programs that seem to work well at one school not be so successful at another. Unfortunately, "fundamental understandings of essential school change cannot be readily conveyed or transplanted from one school site to another…" concluded Prestine and Bowen (1993), as they must "…take root within the context of the individual school" (p. 315). For this reason it is important that school leaders have a general understanding of the basic principles of change processes that they can call upon when necessary rather than relying upon adopting what may have worked in another building.

As Goodlad (1984), Sarason (1990), Barth (1990), Fullan (1991), and Schlechty (1990, 1997) suggested, positive and enduring change in American public education, that which will ultimately improve student learning and achievement*, must primarily occur at the building level.* Ironically, it is at this level that principals and teachers are likely to be the least knowledgeable about general theories, models, and strategies for implementing change, and need help in this regard (Evans, 1996; Fullan, 1991).

According to Evans (1996), the traditional, predominant concept of a school leader needs to be transformed to include the identity of strategic-systems reformer and change agent. Transformational school leaders understand the

process of change, and have the knowledge, ability, and foresight needed to provide teachers, parents, school boards, students, and anyone else with a vested interest in the school with the information, skills, and time necessary to successfully prepare for and adapt to a constantly changing environment. Such leaders recognize that change is inevitable and that it will continue to occur. In response, they create and maintain enabling school climates in which teachers are encouraged to invent or experiment with new ways of delivering instruction and utilizing resources to better meet emerging instructional challenges (Schlechty, 1997).

Others involved in the affairs of schools also need to have a mindfulness of the process of change. Teachers need to know about and understand the dynamics of change for their own sense of efficacy and also so they can provide their students with the skills and abilities needed to cope with change in the society they will inherit. Teachers who understand the process of change should be better able to cope with the "this too, shall pass" syndrome that has resulted in the defeat of many worthwhile new programs or approaches. "We [educators] are always responding to one reform proposal or another. Skeptics believe this reform will pass too, to be followed in another decade by another round…" (Mehlinger, 1995, p. 23). Often, worthwhile innovations are never really given a fair chance to work because of a resistance to change on the part of many teachers who have learned that "this too shall pass" rather than try something new (Cuban, 1990). To minimize such resistance, policies and guidelines should be established and maintained at the district level that

encourage and enable teachers and building administrators to research, invent, and experiment with new curricula and instructional strategies without fear of negative consequences should such experiments not be successful (Schlechty, 1997). As Handy (1990) put it,

> Those who know why changes come waste less effort in protecting themselves or in fighting the inevitable. Those who realize where changes are heading are better able to use those changes to their own advantage. The society which welcomes change can use that change instead of just reacting to it. (p. 4)

Generally, individuals and organizations are more likely to accept a change when they understand that it is in their best interest to do so and when they have obtained the knowledge and abilities needed to cope with the change successfully. Transformational leaders recognize these factors and diligently work to prepare other persons involved in their schools and organizations to learn about and adapt to the ever-changing needs of society. Prestine & Bowen (1993) suggested that establishing and maintaining an atmosphere for organizational learning and adaptability should be an on-going, never-ending process:

> The process of thoughtful change should not be "something we did" but "something we do." As with the individual learner, the goal should be the development of school organizations that are "lifelong learners," capable of continually assessing their own understandings and striving to move beyond what is presently known. (p. 317)

Leaders of schools and other endeavors who pursue organizational learning and adaptability will be more likely to see their schools and organizations survive, succeed, and prosper than those who resist the process (Senge, 1990). Towards this end, the *Change Delineator Theory* has been developed by the researcher to provide leaders in education and other organizations, as well as anyone else who might be interested in the phenomenon of change, with an additional perspective and, hopefully, a greater understanding of the processes involved. Once fully developed, the Change Delineator Theory may also provide leaders with a practical tool for determining the readiness of their colleagues and employees (and thus their overall organizations) for change.

3. DEVELOPMENT AND DESCRIPTION OF THE
CHANGE DELINEATOR THEORY
3.1 Perspectives on Theory Development

As this study is centered around the creation, testing, and possible validation of the Change Delineator Theory that has been developed by the researcher, the literature needs to be reviewed and some comments made concerning the definition, purpose, development, and validation of theories. According to Webster's Third New International Dictionary (1981), the word *theory* is derived from of the Greek word *theoria*, which literally means the act of viewing something, such as an object, event, idea, or phenomenon, and therefore involves the act of human perception. Merriam (1988) described theory as a conceptual framework that "…integrates pieces of information into a whole;

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it makes sense out of data (p. 55). Mullins (1971) stated that theories about our social systems and processes "order [one's] understanding of society and give some assurance of predictability to the world" (p. 1), while Sarason (1990) called theory the "...myth that we construct to

understand something we know we understand incompletely" (p. 123).

A theory then, as it is being defined for this research, shall be considered to be an individual's thoughtful attempt to explain a phenomenon after he or she has gained sufficient knowledge about what has been observed to enable serious contemplation and speculation on the nature of the perceived item or event. Subsequently, a theorist is one who beholds and contemplates the essence of that which is being perceived, speculates about causes or reasons for its existence or occurrence, and issues an opinion, judgment, or proposition as a plausible explanation (a theory) for the observed phenomenon.

Theories are explanatory statements that describe concepts and constructs. A *concept* is in simplest terms, "an idea expressed in words" (Mullins, 1971, p. 7). They are used to describe "the similarities or common aspects of objects or events that are otherwise different from one another" (Ary et al., 1996, p. 27), or they may describe "consistent patterns" (Leik, 1972, p. 6). Concepts are generally descriptions of relatively simple things or ideas such as table, book, food, night, day, and so on. They form the foundation of human language. Those concepts that can be quantified and measured are known as variables. Rogers (1962) described theory as consisting of postulated relationships among concepts. He considered a concept a dimension of a theory stated in its most

basic or "primitive" terms. "A concept ideally should be as general or as abstract as possible so that it may be utilized to describe behavior in many different types of social systems" (p. 309).

More complex or abstract ideas, such as those that describe functions or creations of the human mind, e.g. creativity, intelligence, love, anger, business, law, power, relationships, etc. are called *constructs*. Constructs may also result from the combination of two or more concepts if they form more complex abstractions. Constructs are used to build and test theories (Ary et al., 1996).

A theory, if believed by enough people, can affect group or societal beliefs, perceptions, values, and assumptions concerning the nature of reality. This often results in the institutionalization of policies and behaviors that are based directly upon the constructed belief system, even if later observations, logic, and reason would seemingly contradict its validity. "Tacitly held beliefs about knowledge, reality, and methodology…" stated Murphy (1989), an advocate of a postmodern philosophical perspective on knowledge and learning, "…shape whatever is perceived. In effect, because knowledge resides in domains that are defined as real, only 'best estimates' of truth can be produced" (p. 25). The history of the human race is replete with examples of "estimates of the truth", ranging from medieval theories about the shape of the earth and nature of the solar system, to contemporary theories about evolution, relativity, or even the existence of alien life. Of course, some theories are likely to be more valid than others based upon empirical testing, the credibility of the observing theorist(s), the accuracy of the instruments being used, if any, the quality of the data it is

based upon, the inductive and deductive reasoning used, and sometimes but not always, the test of time.

3.2 Criteria for Validating Theory

Because the essence of this study is about testing the validity of the Change Delineator Theory, criteria must be established for judging whether or not the proposed theory meets the same standards as other accepted theories. Leik (1972), Mirriam (1988), and Argyris & Schon (1976) suggested criteria that are useful in evaluating the quality of a theory. The criteria cited by Leik (1972) and Mirriam (1988) are *internal validity* (How well the theory matches or represents reality.); *reliability* (How well the study's findings can be duplicated.); and *external validity* (How generalizable the findings are to other situations.). Argyris & Schon (1976) had similar criteria, but broke them down further into the five categories of: *Internal Consistency* (Are the theory's postulates and variables consistent, or do they conflict with one another?); *Constancy* (Does the application of the theory to real life situations predict or produce consistent results?); *Effectiveness* (How reliably does the theory produce or achieve its governing variables within an acceptable range?); *Congruence* (How well does the proposed theory match observations?); and, *Testability* (Do repeated trials of the theory produce the predicted results?). Both Mirriam (1988) and Argyris & Schon (1976) suggested that in evaluating a study by these criteria, triangulation (using multiple methods and data sources to confirm findings) is one of the best strategies for determining validity. If the multiple sources of information

converge to similar findings or conclusions, the likelihood of the study's proposition(s) being valid increases. However, it should be noted that triangulation of data sources and replication of research is no guarantee that the study or its propositions are in fact valid, as persons operating in a similar situation or out of the same paradigm may very well come to the same incorrect findings and conclusions, e.g. the former theory of the solar system, believed by many people in the so-called middle ages, suggesting that the sun and stars revolve around the earth.

The aforementioned criteria will be used to determine the validity of the Change Delineator Theory. If, after analyzing a theory under these criteria the results are generally positive, then it can be reasonably concluded that the theory is probably sound in explaining an event or phenomenon. But for any theory, no matter how popular or seemingly correct, there is always the possibility that new information can dramatically alter or even totally negate its validity as a viable explanation for the phenomenon in question. Ary et al. (1996) pointed out that while a single study might be able to disprove a theory, research cannot unequivocally prove that a theory is true as it is a generalization designed to explain a particular phenomenon. However, the more a theory is substantiated through multiple tests or studies, the greater is the likelihood that it has validity in explaining, describing, or predicting a phenomenon.

3.3 Developing Theory from Observations, Data, and Experience

One type of theory is known as *grounded theory.* Originated by sociologists Glaser and Strauss in the late 1960s, grounded theories are those that are uncovered by systematically collecting and analyzing information about a particular phenomenon or observed event(s) (Glaser & Strauss, 1967). According to Glaser and Strauss, any theory, regardless of type, has certain primary functions that include the following:

1. It enables others to predict and explain behavior or observations.

2. It is beneficial in advancing knowledge in the area being studied.

3. It is useful and practical in assisting others in understanding and possibly controlling related situations.

4. It offers alternative perspectives on human behavior.

5. It can guide further research into an area of study.

Glaser and Strauss (1967) suggested that to be a good theory, it must be understandable and make sense to both experts and students who are generally knowledgeable about the topical area, yet relatively simple enough to also be understood by "significant laymen" (p. 3).

It should be pointed out that while the accuracy and reliability of the data upon which a theory is constructed are certainly important considerations, a theory is not intended nor designed to be an infallible explanation of what has been observed, as it is in its simplest form a contemplation of one's perceptions

and resulting empirical generalizations. "A theory…makes sense out of data; it summarizes what is known and offers a general explanation of the phenomenon under study" (Merriam, 1988, p. 55).

Glaser and Strauss (1967) emphasized that in developing a theory it is not necessarily the facts or evidence of the case that is of prime importance, but the *conceptual categories* (underlying patterns) or *domains* that are being generated from the data. They believed that when developing or discovering such categories in the process of theory development…

> …the evidence from which the category emerged is used to illustrate the concept. The evidence may not necessarily be accurate beyond a doubt…but the [conceptual category or domain] is undoubtedly a relevant theoretical abstraction about what is going on in the area studied.…Accuracy is not so much at stake as establishing the structural boundaries of a fact…(p. 23-24)

This means, as Murphy (1989) worded it, that while the knowledge or "truth mediated by interpretation in this manner is valuable…this knowledge is not automatically generalizable to any situation" (p. 26). While the circumstances, context, and particulars of any given phenomenon where a theory may apply will vary, if the theory has any truth and validity, it should be able to describe or explain the general "structural boundaries" of all similar cases of the phenomenon in question.

One's job in theory development then, is not necessarily to attempt to know

the entire field, or to have all the facts, or to offer a perfect description of the area being studied, but rather to develop a reasonable, plausible, and well thought out explanation for what has been observed (Glaser & Strauss, 1967). Dunphy (1996) suggested that in this regard theory construction…

…is an important element in coming to terms with our social reality and should play an integral role in understanding organizations and in guiding change attempts. Our theories need to increase our awareness and understanding of ongoing processes of change in organizations, attune us to critical points of leverage, and suggest modes of action that we can apply to these points to attain desired outcomes. The way to develop sounder theories is not to long for some unattainable ideal of scientific objectivity. Rather, we need to expose the limited nature of many of our assumptions so that they may be debated and subject our models to empirical testing. (p. 542)

According to Ary et al. (1996) "Research with a theoretical orientation may be directed either towards developing theories or testing existing ones" (p. 25). Although the specific methods for testing theories may vary, researchers Merriam (1988), Mullins (1971), Glasser & Strauss (1967), and Miles & Huberman (1994) all indicated the importance of empirically testing proposed theories

"against reality" (Mullins, 1971, p. 3). In this regard, after describing the Change Delineator Theory, it will be empirically tested utilizing the case study of the Computing Seniors Program. "A case study might test theory, clarify, refine, or extend theory, or, in qualitative case studies, develop new theory" (Merriam, 1988, p. 58). Furthermore, one case is sufficient to begin the process of validating the theory according to Glaser and Strauss (1967). The theorist does not have to have innumerable supporting cases, nor must he "…know the whole field or to have all the facts….His job is not to provide a perfect description of an area, but to develop a theory that accounts for much of the relevant behavior" (p. 30) or observations.

3.4 Background of the Development of the Change Delineator Theory

Merriam (1988) suggested that "the insights that form the basis of new theory can come from one's imagination, personal experience, the experience of others, and existing theory" (p. 60). The development of the *Change Delineator Theory* is based in part on the researcher's general knowledge about the process of change which he first began studying over 25 years ago as a young graduate student, his current review of the change literature and related research, and his observations of the process of change gained from experiences as a former small businessman and currently as a school administrator. Such experience, according to Mullins (1971), "…is the richest source of motivation to develop theory…" (p. 37).

An entrepreneur in spirit and practice, the investigator has created three

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small businesses and several nonprofit human service organizations, some of which are still in existence after more than twenty years of operation. "Major change theories have been developed by change agents and practitioners who have sought to develop frameworks for understanding and directing change based on their practical experiences in organizations" (Dunphy, 1996, p. 542). As a professional educator, the researcher has designed and implemented curricula, assessment tools, alternative teacher evaluation plans, and instructional programs for children and adults. These activities involved creativity, innovation and adaptation to changing circumstances. "When there is some prior knowledge about the area of inquiry," suggested Leik (1972) "...it is possible to make more precise guesses about what kind of information will be useful" (p. 5) in the process of developing theory about the phenomena under study.

The researcher's prior experiences involving creativity and innovation, combined with his ongoing intellectual interest in the study of change processes, has resulted in many hours of introspection concerning the process of change—why some people seem to fear and avoid it, while others seem to relish and thrive on it. Investigators "should explicitly utilize such personal [knowledge and] experiences, not deny them," claimed Phillips (1971). They must concern themselves "...with interpreting the meaning of what they have already experienced" (p. 159). Thus one day while describing certain aspects of the process of change to a colleague, the idea for the Change Delineator Theory serendipitously began to coalesce in the course of the conversation.

The Change Delineator Theory suggests that *individuals' roles in the change process are the result of certain capacities, more or less present in all human beings, that determine attitudes, behaviors, and subsequent involvement in the process of change. These individual capacities also affect the manner in which many changes occur in groups, organizations, and societies.*

The Change Delineator Theory attempts to explain how people behave when faced with a potential change—why some people seem willing to get involved and participate in it wholeheartedly while others tend to hold back and even resist the process. It describes four roles (Creators, Translators, Innovators, and Practitioners), behavioral capacities more or less present in each person, that relate to one's readiness or willingness to participate in the process of change, whether the change is self-initiated or imposed from without. The term *delineator* was chosen in naming the theory, because to delineate something connotes portraying, outlining, or establishing the boundaries or parameters of an item or thing (Webster's Third New International Dictionary, 1981) as in the case of the intellectual capacities being described. The theory delineates four primary functional modes which may dominate a person's thinking and behavior with regard to the change process.

3.5 Assumptions About People and Their Relationship to Change

Certain assumptions have been made that underlie the development of the Change Delineator Theory. These assumptions are listed in this section to establish a context and frame of reference for the reader about the development

of the Change Delineator Theory, as well as a rationale for some of its components. Some of the assumptions may seem obvious and might be taken for granted, but they are, never the less, assumptions rather than statements of absolute truth. The assumptions are explained in more detail in subsequent sections where they have the most relevance.

1. Change and resistance to change are omnipresent and naturally occurring aspects of the human condition (Evans, 1996).

2. All people have a capacity to cope and adapt to change, as well as a capacity to resist change. These capacities are an integral and natural aspect of every human being's behavioral repertoire. As is true for other human capacities—intellectual, physical, artistic, etc.—the capacity to cope with or to resist change varies from individual to individual (Fullan, 1991).

3. A reciprocal relationship exists between individuals and the organizations and societies to which they belong. The attitudes, beliefs, and values of individuals affect and may determine the predominant attitudes, beliefs, and values in an organization or a society, and conversely, the dominant attitudes, beliefs, and values present in an organization or a society affect, influence, and may determine those of individuals (Katz and Kahn, 1978).

4. At some point, all changes had their beginnings with an individual. Change is, therefore, initially driven by the thoughts and behaviors of individuals (Katz and Kahn, 1978; Schlechty, 1997).

5. Many factors in the environment affect or determine when a change can emerge and the degree to which it can spread (Rogers, 1995).

6. Generally speaking, knowledge and technological advances progress through time.

3.6 A Proposed Theory of Change: The Change Delineator

While one's ability, readiness, or motivation to accommodate a change cannot be directly measured, many of the behaviors and attitudes associated with it can be described and we can obtain an indirect measure of an individual's ability to cope with or adapt to change (Ary et al., 1996). The Change Delineator identifies and describes aspects of a person's intellectual capacity and subsequent behaviors in this regard (Figure 2), or as Gardner (1991) worded it in describing the multiple forms of intelligence, their cognitive performance categories. These conceptual categories are being referred to as preferred *domains* out of which people operate in the process of change. It is suggested that all people have these innate potentialities, although the relative strength in any one area will vary from person to person. At any given time an individual's behavior may be strongly influenced by one or more of the domains depending upon the context in which they live and work, the relative strength of each domain within the individual, and the role the individual is playing in the process of change.

From a postmodernist perspective of reality, the domains of the delineator also describe the process of societal change through time on a macroscopic scale.   Postmodernists generally believe that knowledge and theory originating out of the Western physical and social science traditions are too dualistic, that

reality is in actuality an integrated continuum of experiences and phenomena (Murphy, 1989). From a postmodern perspective, that which affects individuals simultaneously affects the culture and institutions in which they live and work, and vice-versa. To a large degree, the roles people play determine the behaviors expected of them in any situation, and such roles "…are the basic structures of society….Institutions consist of the appropriate roles and their interrelationships" (Murphy (1989) paraphrasing Talcott Parsons, p. 13). Therefore, it seems logical that any theory that describes the roles many, if not most, individuals play in the process of change, should also have relevance to change processes that occur at the organizational and societal levels as these are but extensions of individuals' intellectual capacities, beliefs, personality characteristics, and behaviors on a broader, macroscopic scale.

"Because organizations consist ultimately of people," declared Dunphy (1981), "…organizational change necessarily involves personal change. If we are to be involved in managing change, we need to understand how people change, the circumstances in which they support or resist change, and the ways in which organizational change can contribute to personal development…" (p. 94). Changes that occur in groups, in organizations, or in societies, whether planned or spontaneous, directly induce changes in individuals. Conversely, many changes that occur first in individuals eventually manifest, one way or another, in the groups, organizations, and societies to which they belong. In psychology, this process is known as either reciprocal causation or reciprocal determinism (Ormrod, 1999). History is replete with examples where

one person made a difference through a discovery, or by developing a unique idea, or by beginning a movement that ultimately had a significant impact upon his or her group, organization, society, and sometimes even the world. Either way, we are in reality describing the two sides of the same coin. "In a very real sense," suggested Lippitt (1973), "…we need a better model of man—as an adaptive perceiver, goal generator, decision-maker, actor, and responder—in both micro and macro environmental situations" (p. 19). There is reciprocal uniformity and consistency in the proposed delineator theory as it explains the process of change at the micro level of the individual through the macro level of groups, organizations, and societies. Thus, as postmodernists suggest about the nature of reality, there is no duality in the theory, with one explanation for individuals and another for organizations or societies. Rather, the Change Delineator Theory has explanatory power at both levels.

3.6.1 The Change Delineator on a Micro (or Personal) Level

The Change Delineator Theory describes the domains of change at the individual level in terms of four major states of mind and their representative behaviors, ordered in quadrants as displayed in Figure 2. The quadrant model is useful when describing domains of human personality, character, motivation,

INNOVATORS (adapters, program developers, entrepreneurs)	CREATORS (researchers, explorers, inventors, adventurers)
PRACTITIONERS (implementors, people who make it work, end users)	TRANSLATORS (conceptualizers, enhancers; give meaning of new knowledge to others; storytellers)

Figure 2. The conceptual domains of the Change Delineator Theory: States of mind and representative behaviors in the change process.

leadership, or other traits and behaviors. As with all such representations, a change in the relative strength or activity in one quadrant usually affects the relative strength or level of activity in the others. Each of the domains represents an aspect of every individual's intellectual make-up and resultant be-

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haviors. While every person has the capacity to fulfill these roles, one's ability with regard to the four domains will vary just as other physical and mental abilities vary within the human race. Some people will be inherently more creative than will others, just as some people will naturally have greater physical strength, or are more artistic, or have greater mathematical prowess. Furthermore, the environment and circumstances in which one operates determines to a very large degree how much of any domain or combination of domains will be manifested by a person at any given time. While everyone has the potential to use these capabilities to some degree or another, one's temperament and circumstances may enable or inhibit the degree to which an individual might function out of one or more of the domains.

Other acknowledged experts (e.g., Boyer, 1990; Gardner, 1991, 1995; Mehlinger, 1995; Rogers, 1962, 1995; and Schlechty, 1997) alluded to bits and pieces of domains or categories similar to those proposed in the Change Delineator. In particular, Boyer (1990), Mehlinger (1995), and Schlechty (1997), described aspects of change in their writings that are akin to the conceptual categories presented in the Change Delineator Theory. Boyer (1990), in describing what he believed are the appropriate roles for instructors and professors, proposed that there should be at least four acknowledged and equally respected domains of scholarship at colleges and universities, namely "the scholarship of discovery; the scholarship of integration; the scholarship of application; and the scholarship of teaching" (p. 16). Mehlinger (1995), on the other hand, did not give specific labels to the categories in presenting his ideas

on the process of change, but discussed the kinds of people and the roles they play in the process of change that are similar to the conceptual categories of the Change Delineator Theory. Schlechty (1997) described "five types of actors" (p. 210) who play varying roles in the process of change.   "It is critical', stated Schlechty, "that leaders understand whom they are addressing at different stages in the process, for the needs of different actors will be different from time to time" (p. 210).

The relevant ideas of the aforementioned authors or researchers are presented in the corresponding descriptions of the conceptual categories of the Change Delineator Theory. While they may discuss similar aspects of the process of change, none of the writers seem to put all the conceptual categories together into a theoretical framework about the process of change as it occurs in individuals, groups, organizations, and societies as is attempted in the development of the Change Delineator Theory.

3.6.1.1 Creator Domain

When individuals are in their "creator" mode, they are in the process of creating or discovering new knowledge or behaviors that may be here-to-fore unknown or unexperienced by anyone else, such as in the case of cutting-edge, experimental research and exploration. The idea or knowledge created may also just be new to the individual, such as when a person, young or old, learns by discovery or creates something that is new for him, but may have been previously created, discovered, known or performed by others many, many times

before. Persons who are operating out of their creator mode are frequently thinking "out of the box", diverging away from the safety and security of common practice, belief, and the status quo, and may be on the threshold of developing a new world view or paradigm.

Boyer's (1990) *scholarship of discovery* closely parallels the Change Delineator category of "Creators". As its title implies, the scholarship of discovery concerns the activities of pure research, investigation into the unknown, and the pursuit of knowledge for knowledge's sake. Mehlinger (1995) called people engaged in the activities of this category "revolutionaries", people who "…tend to be independent, self-confident, and unafraid to take risks" (p. 120).

Gardner (1991) described such persons as *disciplinary experts.* Disciplinary experts are persons who

> have sought to establish concepts and practices that provide the best possible account of the world in which we live, even when that account flies in the face of long-standing institutions, received wisdom, or unwitting but well-entrenched stupidity. Instead of accepting that the earth is flat, they have—in the spirit of Christopher Columbus—amassed evidence that it is spherical in shape. (p. 11)

Columbus, contrary to popular belief in his time, had an idea that the world was not flat. Based upon this belief, he literally sailed out to explore unknown realms in search of an alternate route to the orient and unwittingly changed the history of the world.

"Exploration is still the epic journey" exclaimed Robert Ballard, world

renown oceanographer and discoverer of the gravesite of the Titanic, "…To dream, to prepare yourself, to assemble your team of argonauts, to go forth to be tested mentally and physically by the gods. To pass the test, be given the truth, and then to come back and share the new wisdom…" (Vesilind, 1998, p. 41), poignantly describes the creative and adventuresome aspect of the human spirit.

Creators are often risk-takers. Schlechty (1997), in describing his view of the roles people play in the process of change, identified such individuals as "trailblazers" (p. 210). Trailblazers take "paradigm-breaking journeys…" venturing into realms "…where no person has gone before, without maps and without the benefit of empirically based models and with little to guide them except belief in themselves, a desire for novelty, the freedom to try, and the vision that motivates and guides them" (p. 210). All people, regardless of age, educational attainment, or other factors, have this innate capacity to be creative. The ability to create is considered to be among the highest of human intellectual faculties. "It is the ordinary genius of Homo Sapiens, it is our singular gift," commented Cookson (1998) "…which we ought not to neglect or abuse" (p. 46).

On the macroscopic scale, creators are in the front line of the advancement of knowledge of the human race. Individuals functioning out of their creator mode often discover something or literally create something that has never been seen, done, or known before, whether it be new scientific research into unknown realms in its purest form; a new perspective in art, music, philosophy

or religion; or a physical feat such as breaking the four minute mile. They are the ones who make the discoveries that generally result in economic, technological, and social progress. "Clever people, making clever things or providing clever services, add value, sometimes a lot of value, to minimal amounts of raw material….That is the way prosperity advances" (Handy, 1990, p. 14).

In describing various styles of leadership, Gardner (1995) considered such a groundbreaking person a *visionary* leader, an individual who "…creates a new story, one not known to most individuals before…" (p. 11). Baba & Zeigler (1985) labeled a classification of people who "somehow escape the canalization which restrict[s] the behavior of their less-adventurous colleagues" (p. 15), as sociological deviants. The deviants, Baba & Zeigler (1985) suggested, are an "an indispensable ingredient in the innovation formula" (p. 15).   Similarly, Handy (1990) called such people "unreasonable", meaning they were capable of thinking outside the box, or as he worded it, of doing "up-side-down thinking" (p.212).

Examples of some of the most famous persons who thought "up-side-down" and were acting out of their creator mode are Jesus, Buddha, and Mohammed, whose explorations into the mystery of life and the nature of God resulted in the formation of new religions (although perhaps unintentionally); Copernicus' creation of the telescope that resulted in a totally new perspective of the solar system and subsequently man's place in the universe; Newton's creation of calculus, formulation of the laws of motion, and discovery of the universal law of gravitation dramatically changed mathematics, machines, work, and ulti-

mately the world (Serway & Faughn, 1995); Einstein's work on the Theory of Relativity that opened the gateway to the new field of quantum physics and the nuclear era; Mendel's (the founding father of genetics) formulation of the theory of heredity that ultimately led to the development of genetic engineering; and Darwin, whose exploration and observation of the Galapagos Islands and its uniquely adapted flora and fauna led to the development of the Theory of Evolution. For many of these explorers of unknown realms, their discoveries or creations were initially (and some are even to this day) met with great skepticism, controversy, hostility, and scorn.

More recent examples of people operating out of their creator mode are Jacques Cousteau and Robert Ballard, oceanographers, inventors, and explorers of the oceans who have significantly added to our knowledge of the waters that cover about 70 percent of the surface of the earth; and astronaut Neil Armstrong, the first man to step foot on the moon, who, supported by the work of his predecessors and tens of thousands of technicians, research scientists, and engineers helped to bring mankind into the space age. Other examples are James Watson, discoverer of the code of DNA which lead to the establishment of the genetic engineering industry, and the Leakey family (Louis and Mary, their son Richard and daughter-in-law Meave, and their granddaughter Louise), paleoanthropologists who over three generations have increased our knowledge of the evolution of the human race and pushed back its origins by some two million years with the innumerable archeological discoveries they have uncovered in the Olduvai Gorge of eastern Africa (Vesilind, 1998). The

past and the present are full of innumerable examples of such creativity and discovery in all areas of endeavor, although most are not so well known.

Once the new knowledge has been revealed to the world, many other persons are able to learn, do, or experience the same thing, ultimately resulting in a change in beliefs, methods, possibilities, and expectations while raising the collective knowledge and abilities of the human race to new heights. It is in this manner that knowledge spreads to and through societies, organizations, and individuals (see Figure 5). This aspect of the theory is discussed in greater detail in a forthcoming section. Of course, not all creations move societies forward, and some, such as aspects of Einstein's work that led to the development of nuclear weapons or the latest discoveries being made by genetic engineers, may under the right (or should it be said wrong?) circumstances, eventually prove to cause our downfall. But generally speaking, most new knowledge is considered part of the phenomenon we call progress.

3.6.1.2 Translator Domain

"Information is the lifeblood of a living system—whether a school, a district, or another kind of organization" (Brown and Moffett, 1999, p. 116). "Translators", therefore, play a vital role in the process of change. They are the persons who have significant knowledge and expertise in two or more arenas. Initially, much of the knowledge or capability that is invented or discovered by "creators" is at such a technical or expert level that the average person does not have the prior knowledge, ability, or language needed to adequately comprehend the

new knowledge or to be able to effectively use it. "…Researchers and program developers often don't recognize the importance to the "consumers" [practitioners] of their wisdom of making connections across models, programs, and paradigms" (Brown and Moffett, 1999, p. 109). In a manner similar to persons who are multi-lingual, translators typically have knowledge and expertise in two or more fields. Translators are, therefore, able to explain, define (translate), and effectively communicate information that has been generated in one field of endeavor to persons whose knowledge and expertise is in a different area. Translators are the "storytellers" of the change process, persons who, often through the use of analogy and metaphor, bring the discoveries of the creators to a larger audience through their books, articles, conference and symposium presentations, and other means. While Schlechty (1997) did not have a translator category as such, he described their function as ensuring

> that the stories [of creators] are turned into lessons that can serve as
> sources of guidance for those who would follow, much as mapmakers
> translated the tales and reports of the early explorers into crude maps
> that later "researchers" refined and rendered increasingly accurate….
> Such storytelling serves not only as a source of information for others but
> also as a continuing source of motivation for the trailblazers [creator
> mode]. (p. 212)

Boyer (1990) described his *scholarship for integration* as the giving of "meaning to isolated facts, putting them in perspective…" and of "…making connections across disciplines, placing the specialties in larger context, illumi-

nating data in a revealing way, often educating nonspecialists, too…" while also bringing "…new insight to bear on original research" (p. 18-19). Without such communication, Boyer asked, "How can knowledge be responsibly applied to consequential problems? How can it be helpful to individuals as well as institutions" (p. 21)? Mehlinger (1995) suggested that every revolution (change) needs one or more persons to present the issues, to describe what is going on, to explain new ideas, products or innovations, to prod others into action and to assist them in learning new methods. He referred to such persons as "the conscience of the revolution" (p. 121).

In their analysis of the research literature conducted to uncover factors that promoted individual or organizational readiness for change, Armenakis, Harris, and Mossholder (1993) determined that communicating the "message for change" (p. 684), that is, why the proposed change is necessary and worthwhile, is of primary importance to the ultimate success of its adoption and implementation. Communicating the need for change in order to establish new beliefs, attitudes, and behaviors was also identified as an important component of the process of change by Brown and Moffett (1999), Katz and Kahn (1978), Rogers (1962, 1995), and Zaltman, Florio, & Sikorski, (1977).

Robert Sylwester, Professor of Education at the University of Oregon, is a former high school biology teacher who has made it his business to keep abreast of the latest research and discoveries about the structure and functioning of the human brain. While Sylwester is not a physician or research scientist, nor has he used MRI technology to explore the deepest and most

unknown reaches of the brain, he has made it his business to become literate and knowledgeable enough about neuroscience to be able to understand the field.

In his teaching, writing, and speaking, Sylwester explains to others, mostly teachers and administrators, the latest research and discoveries in this field. Interpreting it in terms most lay people can understand, he suggests what this new knowledge may mean for persons involved in the day-to-day business of teaching and learning. "He takes the complex, technical concepts of brain chemistry and functioning and gives them to the educator in simple English" wrote the reviewer of Sylwester's recent book entitled <u>A Celebration of Neurons</u> (Anonymous, 1996, p.3). While obtaining new knowledge does not necessarily mean that a person will change their beliefs, attitudes, or practices, not having such knowledge virtually guarantees that no change(s) will occur. Without "translators" such as Sylwester, few if any changes in teaching beliefs and practices would ever be likely to occur as a result of newly generated knowledge in the field of neuroscience.

3.6.1.3 Innovator Domain

All areas of human endeavor where new knowledge or information is being created or discovered, must have "translators" to spread the word. They are the missionaries of new knowledge and ideas. However, in order for change to occur, simply having new knowledge alone does not mean that anything differ-ent will happen. Knowledge must be put into action for change to occur.

Innovation is a *process of implementation* that typically results in a change.

Unruh and Alexander (1974) defined an innovation as "…the introduction of a novel factor, perceived as new…and implemented as a practical advance that deviates from established or traditional norms" (p. 24). "The innovation is the change object," stated Zaltman & Dunkin (1977), "All innovations imply change, but not all change involves innovation" (p. 12). "Innovators" are those persons who, upon learning about the latest discoveries, knowledge, or insights, see and understand, often before many others do, where the practical application of this information may very well move their group or organization forward, potentially solve problems, or where it may improve their own or others' personal lives and standard of living. Rogers (1962) labeled such persons "early adopters" (p. 111). They see the possibilities inherent in new ideas before most other people do and are willing to risk trying them out. "An innovator must be able to conceptualize relatively abstract information about new ideas and apply this new information to his own situation" (Rogers, 1962, p. 111). Through the activities of innovators, new ideas and practices are diffused through groups, organizations, cultures, or societies and are eventually adopted by the masses. They are key players in establishing change.

Innovators might also use the knowledge or ideas created by others to solve every day kinds of problems in "innovative" or novel ways as is typically done by architects, engineers, and designers. "Engineering uses scientific knowledge of physical things and processes to exploit "new" possibilities and potentialities….Newly invented concepts in basic research [lead] to engineering concepts

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of practical utility" (Bennis, Benne, & Chin, 1969, pp. 129-130). Other persons who generally use and apply knowledge created by others in this fashion might be planners, product developers, and entrepreneurs.

Boyer (1990) defined his category of *scholarship of application*, which is similar to the Change Delineator's category of "Innovators", as theory applied in practice in an attempt to solve real world problems of the larger community. This Boyer claimed, is where new knowledge, ideas, or innovations are first applied, often through a trial and error process, to solving real-world problems. Similarly, Mehlinger (1995) described the important role in the change process that is played by individuals or organizations that sponsor or operate pilot projects or demonstration sites, or are otherwise engaged in the transfer of new ideas to potential end users. An example he gave of an organization that regularly functions in this manner is the National School Board Association's Institute for the Transfer of Technology to Education (Mehlinger, 1995).

The act of innovation is very similar to that of creation, and in fact the two may overlap. "The question of just where to draw the line between innovative and visionary [creator] is not easy to determine" (Gardner, 1995, p. 11). Therefore, an innovation could be considered an act of creation if the innovation presents something entirely new, never having been done before by an individual, group, or organization. However, while innovators may seem to be "creating" a new program, company, service, device, or other thing, they are generally in the act of *applying* knowledge or methods that were previously created by others. "The innovative leader takes a story [a concept or idea] that

has been latent in a population, or among the members of his or her domain, and brings new attention or a fresh twist to the story" (Gardner, 1995, p. 10). In this manner, innovators apply knowledge in novel ways to solve practical problems they or their organizations face.

"Innovators adopt new ideas, but they do not necessarily invent them" (Rogers, 1962, p. 195). Robert Oppenheimer, Director of the Manhattan Project during the 1940's, in cooperation with many other scientists, used and applied theories and formulas originally created by Albert Einstein to develop the atom bomb, an innovation that brought the world into the nuclear age. According to Senge (1990), "Engineers say that an idea has been "invented" [creator mode] when it is proven to work in the laboratory. The idea becomes an innovation only when it can be replicated [applied] reliably on a meaningful scale…" (p. 5-6).

According to Rogers (1995), innovators are frequently considered deviants, mavericks operating on the fringes relative to the majority of people in a social system. They are generally the first ones to depart from established norms to implement new methods or ideas and tend to thrive on the margins of their organization or society. Steven Jobs and Stephen Wozniak did not create the knowledge that led to the development of the micro processor, but they did see a potential application for the microchip in a small, compact "personal" computer. When, back in the early seventies, they could not convince their supervisors at Hewlett Packard (HP) of the potential for such a device, they decided to leave HP to start their own small company, which, as the story goes, they

began in one of their garages. The two entrepreneurs called their new device and venture company "Apple."

There are innumerable other examples of innovators who have achieved unparalleled levels of success, many becoming multimillionaires virtually overnight in the young history of the technological revolution. A good example of such a person is Jeff Bezos, founder and chief executive officer of Amazon.com, the Internet's largest and most successful online merchandising company to date. According to Bayers, who recently wrote a brief biographical story about his stellar rise, Bezos did not create the Internet, nor had he ever had much to do with retail merchandising before coming up with his innovative and pioneering business model. Rather, in typical innovator fashion, "Bezos' vision [was] about taking advantage of a new platform and tools to change shopping itself" (Bayers, 1999, p. 116).

Bezos came up with an idea for a novel approach for marketing and selling books and CD record albums over the Internet. He was unable to convince the leadership of a Wall Street firm for which he worked, that such a venture had great financial promise, so with little more than a strong belief in his idea and in his own abilities, Bezos left New York and moved to Seattle, Washington to start his own company. With the financial backing of friends, relatives, and a few venture capitalist supporters, Bezos was able to start his entrepreneurial venture in July of 1995 with an initial capitalization of about one million dollars. Sales began to skyrocket within weeks of opening for business on the net. Within four years, Amazon.com has grown into a mega company with sales of

$350 million a quarter and a stock market value in January, 1999 of an incredible 29 billion dollars! According to Bayers (1999):

> It wasn't that Bezos was first out of the box with an idea for shopping, or that he had discovered some magic elixir unknown to other merchants. But he had made a series of small, smart choices that added up….[Bezos combined] pragmatic choices with a relentless focus on the customer experience: tweaking the interface to make it ever easier, streamlining the ordering process at every turn, responding immediately to every customer query. (p. 174)

In summary, Jeff Bezos has become incredibly successful by taking a number of ideas, mechanisms, and services created by others, and combining them in an innovative and highly effective manner. According to Bezos, to achieve a success such as his "requires a lot of innovation, and innovation requires a lot of random walk" (Bayers, 1999, p. 187) in the search for new ideas and methods to better meet the needs of his customers and to stay ahead of the competition.

3.6.1.4 Practitioner Domain

Finally, in order for change to occur, the knowledge that has been discovered or created that is translated to others and is eventually put into some form of practical application, must be adopted and used by masses of people on a day-to-day basis. "After all," commented Evans (1996), "a good solution is only useful if people adopt it, if its implementation enables them to really make

it on their own" (p. 15-16). In the field of education, "Any significant

change…must ultimately affect the relationship of the teachers and the taught"

(Unruh & Alexander, 1974, p. 243). This is a good way of conceptualizing the

"practitioner" level.

What the Change Delineator Theory generically describes as the Practitioner

category, Boyer (1990) referred to in the field of higher education as the *schol-*

arship of teaching. According to Boyer, it is through the practice of teaching

that the work of those engaged in the other scholarships of research, integra-

tion, and application becomes a part of every day, routine function and prac-

tice. In a similar vein, in his book about the technological revolution that is

spreading through the field of public education, Mehlinger (1995) described a

number of individual teachers who are routinely involved in utilizing computers

and related technologies in their day-to-day instructional activities, and sug-

gested that it is at this level where the revolution (change) actually occurs.

Practitioners, then, are those people who make the world function on a daily

basis. Trailblazers, acting out of their creator domain, may have discovered the

west, to use Schlechty's (1997) metaphor, but it was the "settlers" (p.214) who

tilled the soil, built the cities, and did the work. Schlechty's idea of "settlers"

also parallels and supports the Delineator's concept of the "practitioner" in the

process of change and in the Delineator Theory.

When acting as practitioners, people take the knowledge or innovations cre-

ated, discovered, or designed by others, and once informed of and convinced of

their benefit, put them to regular use in conducting the business of their day-

to-day work and lives. Rogers (1962) labeled such persons the early adopters, early majority, or late majority, depending upon how quickly they adopt and use an innovation, and estimated that this combined group comprises about 78 percent of the population (with the balance made up of creators, innovators, and those people who absolutely refuse to adopt or accept change, who Rogers called laggards). Practitioners typically must be shown the way. They must be convinced that the suggested change is better than the established norm, and typically resist adopting new ideas or methods when they are first introduced. "All change involves learning…" stated Fullan & Miles (1992), and "…all learning involves coming to understand and to be good at something new" (p. 749). People are operating out of their practitioner mode when they need to be told "…what they are expected to do and where they are going to go. They need much more detail and more carefully drawn maps than those who have gone before them" (Schlechty, 1997, p. 214).

The majority of people, regardless of their primary domain of thinking or behavior at any moment, function most of the time in the role of a practitioner. A practitioner might be the classroom teacher who is putting the latest knowledge about brain functioning and multiple intelligence into daily practice by preparing several approaches to delivering a lesson to her students, the secretary who is using a personal computer to write a letter, the business manager who is increasing production through the use of systems thinking on the assembly line, or the soldier who is using a laser device to target an enemy objective. The list of practitioners is as lengthy as the list of occupations and

other human endeavors.

Practitioners are absolutely critical to the change process. For the process of change to be successful, it must be adopted and implemented by persons operating out of their practitioner domain. An invention, discovery, or creation is nothing more than an idea, rather than a change or reform, if it is not put into use. "It is clear that research alone is not enough to solve most problems; the research results must be diffused and adopted before their advantage is realized" (Rogers, 1962, p. 3).

3.6.2 Presence of the Delineator Capacities Within Each Individual

According to the propositions of the Change Delineator Theory most, if not all, human beings have the intellectual capacities and abilities described by each quadrant. An individual may spend most of his or her time functioning in the role of practitioner, but can and does when the occasion warrants perform in the role of creator, translator, or innovator. The presence and integration of these innate capacities within each of us, combined with the ability to learn from our experiences, has enabled our species to survive and advance in virtually every environment on earth and beyond. From our earliest days hundreds of thousands of years ago, when some ancient ancestor first realized that he could use and eventually make tools that would help him survive in a hostile world, down to the present time, these abilities have enabled us to create, invent, implement, and share with others of our kind solutions to innumerable

problems we faced. Senge (1990) called this process "generative learning" (p. 14).

As represented by the diagram in Figure 3, the Delineator Theory suggests
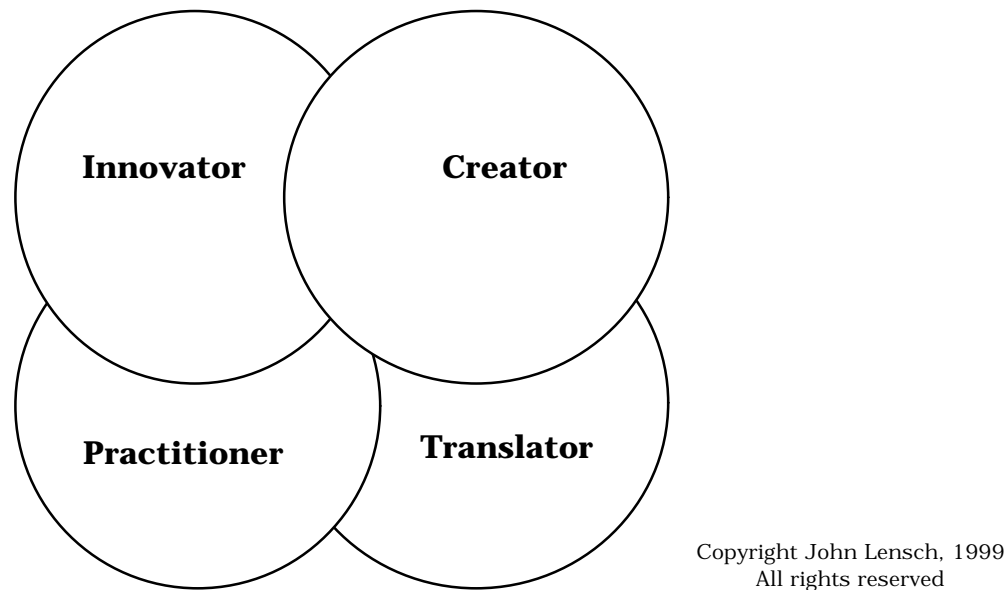
Figure 3. **Delineator capacities are present and overlap within each individual**.

these qualities are ever present and overlap within each individual. However, these are not static categories of equal magnitude as depicted, but are dynamic—each swelling, contracting, and overlapping the others in varying degrees of dominance as an individual's situation changes.   As one's circumstances change, a corresponding modification in the relative strength of the categories occurs as the individual adapts his or her behavior to better match the new circumstances. What a person believes to be the nature of the environment he finds himself in—one supportive of creativity, innovation, and risk-taking or just the opposite—strongly influences the relative level of activity of

any of the four factors being exhibited by an individual in varying situations (Figure 4).

A person's position in a business or organization and the organization's formal or informal structures that govern what is allowed and what is not, have a great deal to do with how much freedom that person believes she might have to innovate or to experiment with new ideas. In addition, personal variables can affect how a person will respond to change. One's prior experiences, how she was raised and educated, or how previous employers treated her can strongly influence how much of a risk-taker she will be or how much of her creative inner self she is going to reveal or expose to others in a new situation.
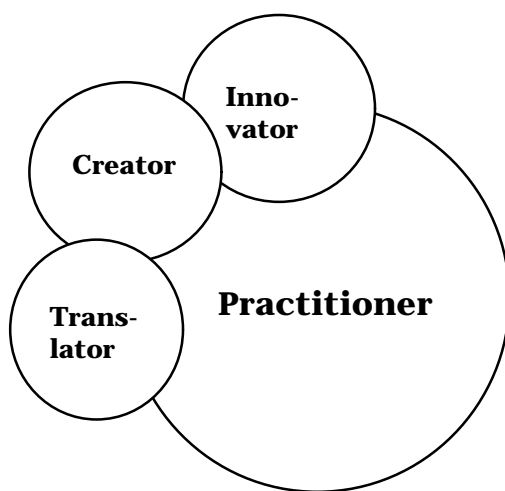
A: Typical scenario when a person is
in a restrictive or status-quo situation.
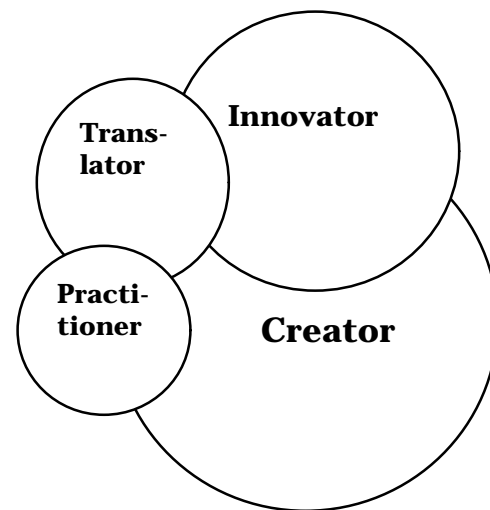
B: Typical scenario when a person is in
an environment conducive to change.

Figure 4. The relative strength of any domain is determined to a large degree by the environment or organizational structures surrounding the individual.

If, in a past experience, she unsuccessfully experimented with creativity and innovation, and was embarrassed or otherwise hurt in the process, she may be very hesitant to try such things again. Such a person could be said to have a low sense of self-efficacy for the processes of change. "People who learn that they have no control over unpleasant or painful events in one situation are unlikely, in later situations, to try to escape or avoid those aversive events even when it is possible for them to do so" (Ormrod, 1999, p. 5). If they have had unpleasant experiences coping with change, such persons may just give up, making little or no effort to adapt to the new circumstances. In psychology, this concept is sometimes called learned helplessness (Ormrod, 1999).

3.6.3 The Change Delineator on a Macro (Organizational or Societal) Scale

On a macroscopic scale the four capacities described by the Change Delineator provide a perspective of the process of change as it occurs in groups, organizations, societies, and the world. As was suggested by Katz and Kahn (1978), "All social systems, including organizations, consist of the patterned activities of a number of individuals…which are complementary or interdependent with respect to some common output or outcome" (p. 20). Therefore, the actions of many like-minded individuals operating at the micro level are relevant to and are a determinant of what happens on the macro scale of organizations and societies. At the same time, the activities and structures that exist on the macro level play a major role in determining the conforming attitudes and behaviors of individuals at the micro level (Senge, 1990). The two

are integrally connected and are co-determinants of each other.

The four quadrants that delineate the mental capacities and behaviors of individuals involved in the change process can be sequentially aligned into a pyramidal hierarchy represented as the head of a vector of change as it occurs on a macro level (Figure 5). In physics, vectors are used to describe the magnitude and direction of a force in field dynamics. Using the vector metaphor, Figure 5 displays how individuals, groups, organizations, cultures, and societies progress through time as new knowledge is discovered or created.

Figure 5 depicts how, as societies move forward into the future, new knowledge and discoveries revealed by persons working in their creator modes and the subsequent activities of translators and innovators, create changes that reverberate into and through cultures, societies, institutions, groups, and individuals, and eventually become integral, often taken for granted, aspects of our day-to-day practitioner activities. Consequently, it is often at the practitioner level that new needs or problems first emerge, providing the stimulus and motivation for further activity of persons operating out of their creator and innovator modes. As Senge (1990) put it, "Today's problems come from yesterday's solutions" (p. 57).

Progress in time

A fluid, ever-changing environment

(Individuals, organizations, and societies generally use and apply the new knowledge, products, and services to solve problems and improve the quality of life.)

The
FUTURE

(The use of the new knowledge, products, services, etc., produces new circumstances and a new set of problems to be solved.)

Inertia & Entropy

Creators

Translators

Innovators

Practitioners

New
**knowledge &
discoveries**

**New demands,
desires, & needs**

**Societies
Organizations
Groups
Individuals**

Inertia & Entropy

(New knowledge, methods, tools, products, and services eventually diffuse to and are used by individuals, organizations, and societies)

Figure 5. The Change Delineator Theory on a macro scale. The theory describes how the activities of persons acting from their delineator modes affect individuals and societies on a macro scale. Inertia and entropy, omnipresent in the environment, affect the rate at which new knowledge and discoveries diffuse, and also the rate at which new needs and demands are made known.

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The diffusion and practical application of the knowledge, inventions, or in-novations generated by the activities of persons operating in their creator or innovator modes, produce new processes, methods, tools, equipment, prod-ucts, services, and even entire businesses and industries that, in turn, create or reveal a new set of needs, desires, and problems, real or imagined, providing a spawning ground for new areas of creativity, research, experimentation, and innovation (Figure 6). Sarrason (1996) alluded to this cycle when he suggested

feedback loop

PROGRESS →

New needs, desires, or problems generated by the diffusion and use of the new knowledge, innovations, products, or services by practitioners

Individuals
Groups
Organizations
Societies

New frontiers, opportunities, problems to be solved, areas for research, and experimentation by persons acting in creator and innovator modes

← KNOWLEDGE

feedback loop

Figure 6. The Cyclical nature of the Change Delineator Theory. Feedback loop displaying one way individuals or persons in organizations behaving as practitioners sometimes produce new problems or needs to be worked on by persons thinking or behaving in their creator or innovator modes.

that "Problem creation through problem solution is as true in social living as it is in science. The more you know, the more you have to know" (p. 35).

It has been said that necessity (need) is the mother of invention (creation). However, not all creations or discoveries are the result of people consciously trying to solve problems or to meet the needs of society. Sometimes, people functioning in their creator or innovator modes discover or invent things seren-dipitously, things that others in society do not know they need or want at the time of the idea's or invention's development and initial use. Furthermore, many of the products and services now in common use were not originally de-signed with personal or home use in mind. Such items are often originally de-veloped for military, business, industrial, or other purpose and only later find practical application for and widespread use by the average person in society. The microwave oven, personal computer, Corning ovenware, Internet, Jeep, and many synthetic materials would be a few examples of such creations.

The activities of people acting out of their practitioner mode can also result in a change or innovation diminishing in value and eventually becoming extin-guished if it no longer satisfies their personal needs, the needs of their organi-zation, or those of society (Katz & Kahn, 1978; Minzey & LeTarte, 1994; Ter-reberry, 1976). Example A in Figure 7 graphically displays the emergence and growth of a change as its value to society increases, while Example B displays the life cycle of a change as it comes into existence, increases and subse-quently diminishes in value, and ultimately disappears from the scene.

Example A: Changes that fulfill needs (have value) grow in popularity and diffuse through organizations or societies.

Example B: A change may expand so long as it meets needs. When it no longer does so, it begins to diminish in value and may disappear.
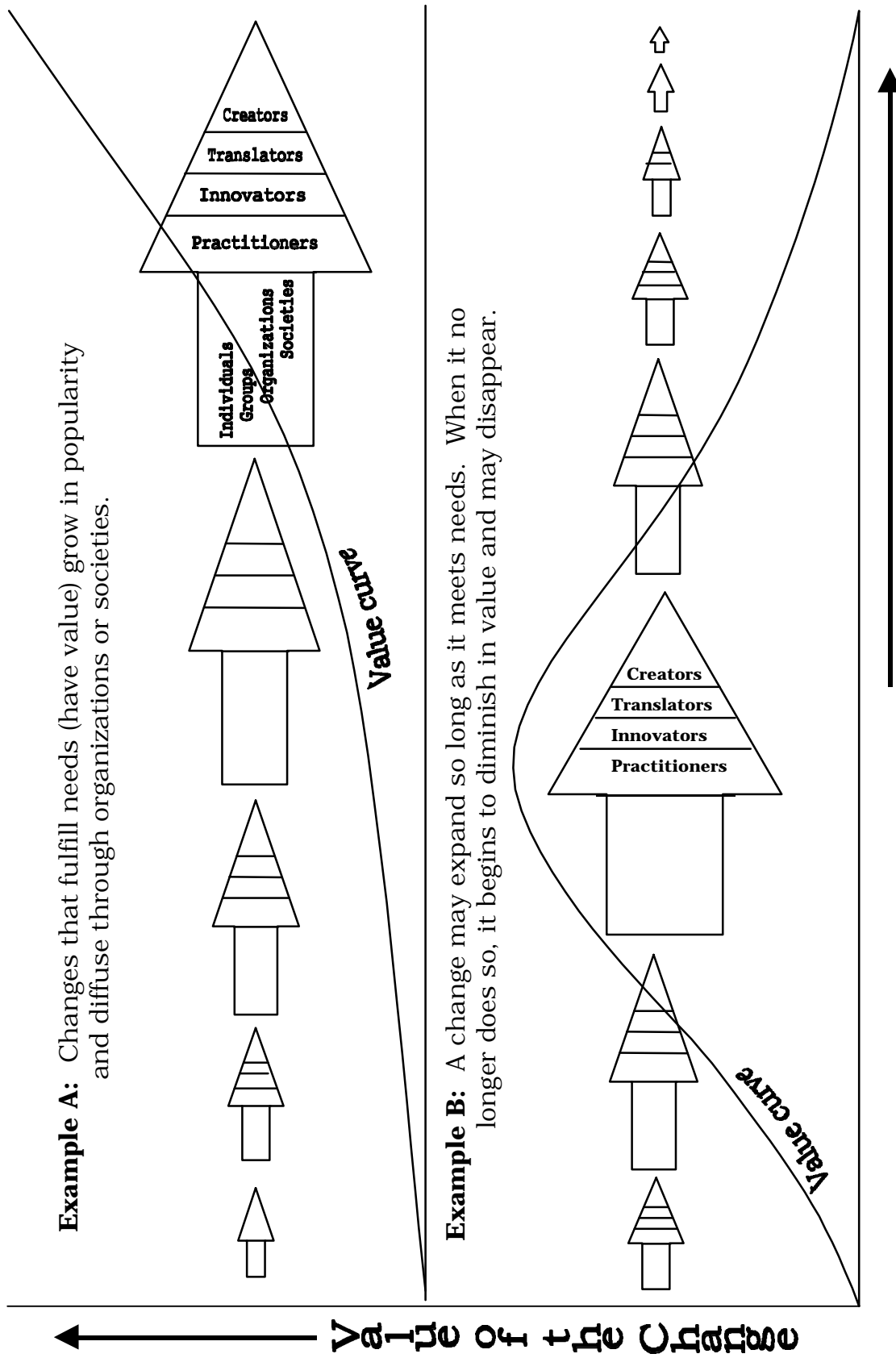
Figure 6: Change Delineator Theory describing growth and diminishment of a change. As it (A) meets needs, and (B) ceases to meet needs. As the value of the change increases, so does the magnitude of its impact on society.

On a macroscopic scale, the Change Delineator describes a never-ending cyclical system of processes or "structures that recur again and again" (Senge, 1990, p. 73) for solving the problems and overcoming the challenges faced by the human race in our never-ending attempt to bring order, predictability, and control into our chaotic environment.

3.7 Resistance to Change

No theory of change can be considered complete without also addressing the phenomena of resistance to change. A great deal has been written about resistance to change. Zaltman & Dunkin, (1977) define resistance to change as "any conduct that serves to maintain the status quo in the face of pressure to alter the status quo" (p. 63). As it is axiomatic that change is a universal factor in the human condition (Brown & Moffett, 1999; Handy, 1989; Evans, 1996; Fullan, 1991; Lippitt, 1973), so also must it be that the antithesis to change—resistance—is an omnipresent factor and a universal response available to human beings when faced with change. "Resistance to change is a predictable part of the change process. It is a normal response to individuals constructing personal meaning about the necessity or wisdom of changing behavior, practices, priorities, or beliefs" (Brown & Moffett, 1999, p. 134).

Prior to getting into a discussion of this aspect of the change process, it should be noted that resistance is not necessarily a negative factor, as many changes should be resisted and rejected if they are likely to produce harmful results. There are many possible explanations for why resistance is likely to be

an innate response in human beings to change. Three in particular, derived from biological and physical sciences are pertinent to the Change Delineator Theory. These forces are homeostasis, inertia, and entropy.

One reason for the existence of resistance to change is *homeostasis*, a term borrowed by anthropologists and sociologists from the field of biology (Baba & Zeigler, 1985; Katz & Kahn, 1978; Zaltman, Florio, & Sikorski, 1977). In biology, the principle of homeostasis refers to "the maintenance of constant internal conditions despite fluctuations in the external environment" (Postlethwait & Hopson, 1992, p. 431). As a result of homeostasis, all organisms, including human beings, instinctively seek to function and maintain themselves within a fairly narrow range of environmental factors. "The central problem for a living thing...is to maintain a steady state internally in the face of an often harsh and fluctuating external environment" (Postlethwait et al., p. 432). Sociologists, and other students of change processes, use homeostasis to describe the conservative tendency of human beings to resist change and maintain the status quo as a common, preferred course of action (Baba & Zeigler, 1985; Zaltman, Florio, & Sikorski, 1977). Homeostasis can be thought of as an individual's, organization's, or society's attempt to maintain an equilibrium, to "keep things the way they are or keep me behaving in my customary ways" (Lippit, 1973, p. 29).

Resistance to change may be further explained and understood in light of the processes of *inertia* and *entropy* (Lauer, 1982). Inertia and entropy are terms originating in the physical sciences that are used to describe principles

of mechanics and thermodynamics (Serway & Faughn, 1995). These terms have also been adopted by cultural anthropologists and organizational sociologists to describe various aspects of human behavior in individuals, groups, organizations, and societies (Baba & Zeigler, 1985; Eccles, 1994; Katz & Kahn, 1978; Lauer, 1982; Lewin, 1951). "Culture is, after all, a biobehavioral extension of the earth's dominant life form [humans] and thus may be subject to the influence of certain basic [natural] developmental laws that affect all life as we know it" (Baba & Zeigler, 1985, p. 14).

3.7.1 Inertia

In the world of physics, the Law of Inertia tells us that it takes additional effort and energy beyond that which is needed to maintain a steady state or status quo condition of an object or thing in order to change its condition, state, or to get it to accelerate (Serway & Faughn, 1995). Simply stated, this means that a body at rest will stay at rest, and a body in motion will stay in motion unless it is acted upon by an outside force or disturbance. Inertia is the tendency of natural systems to seek, achieve, and maintain a stable or status quo condition.

Similarly, in the biological realm all living creatures have adapted over the millennia to make the most effective and efficient use of energy and other resources available in their biomes (Postlethwait & Hopson, 1992). Generally, no more effort or energy is expended in this process than what is needed for bodily maintenance, survival, and reproduction (their equilibrium state). Those life

forms that can most efficiently exploit the energy resources of a particular eco-logical niche are more likely to survive and reproduce successfully than those that are less capable of so doing (Postlethwait & Hopson, 1992). Under relatively stable conditions, a biological balance among plants, herbivores, and carnivores is achieved and maintained among all of the living entities within the biome. This equilibrium, a sort of "biological inertia" so-to-speak, is generally maintained until something happens to upset the balance (an outside force) such as a fire, draught, pollution, or intervention by man. "Such imbalance unfreezes the pattern…until the opposing forces are again brought into equilibrium" (Lippitt, 1973, p. 29).

In physical and biological systems then, there is a natural pressure to conserve energy and little is ever wasted. Similarly, many people and organizations typically will not expend the additional energy required to pursue a course of change and innovation unless they believe that the potential outcome of the change(s) will benefit them more than will maintaining the status quo, thus making it worth the expenditure of additional energy and resources as well as the potential risks (Evans, 1996; Fullan, 1991; Zaltman, Florio, & Sikorski, 1977). This point of view emanates from a perspective of man as being "rational", a model "…that continues to dominate our thinking in education….It is grounded in empirical, behavioral notions of human learning, especially the idea that there is a discrete cause-effect linkage between…input and…output (Browm & Moffett, 1999). For example, in the fields of education, business, medicine, finance, and research, career advancement generally requires a per-

son to obtain higher levels of knowledge and skill, typically represented by the attainment of one or more college degrees. To obtain a degree requires a person to invest additional time, money, work, and study ("energy") beyond that which the individual normally uses to maintain his or her current position and standard of living (his or her equilibrium state). For many, they may not have the energy or resources needed to pursue the change, or the effort may not seem worth it to them in terms of what they believe to be the benefits and costs of the anticipated outcome. "People must be sufficiently dissatisfied with their present state of affairs—and their role in maintaining it—or they have no reason to endure the losses and challenges of change" (Evans, 1996, p.57).

Inertia then, as it is used in the social sciences, refers to the tendency of people and organizations not to want to change the circumstances they find themselves in so long as they are basically satisfied with their current conditions. Sometimes, people will not pursue changing their circumstances even when they are somewhat dissatisfied with their work or life. As individuals or in groups and organizations, many people will attempt to maintain the status quo as a first course of thought or action rather than change. Rogers (1962, 1995) called such persons the *late majority*—people who will only change when a great deal of social pressure has been placed upon them. The most stubborn hold-outs he identified as *laggards*, persons he considered die-hard, over conforming traditionalists who try to maintain the status quo at all costs long after most people have accepted and implemented the new ways (Rogers, 1962, 1995). The late majority and laggards tend to go to extremes to resist change.

"To be able to consider alternatives, one must first be [very] dissatisfied with the way things are" (Sarason, 1990, p. 110).

Resistance to change can be thought of as the desire or effort of a person, group, or organization to maintain its equilibrium state once it has been achieved. The process of change will not actively begin until the pressure or need to do so (the outside force) is so great that it upsets the satisfied state of the person or organization. As the thinking goes on the part of many persons and collectively in groups and organizations, it may be better to stay in the comfort zone of that which is known, tried, and true ("if it ain't broke, don't fix it"), even if it is not perfect, rather than risk adopting changes that might make things worse. "People like to feel they know what they are doing. Change creates uncertainty. Uncertainty threatens success" (Schlechty, 1990, p. 91). This is one of the basic principles behind the psychological concept of "fear of the unknown" that seems to be a universal aspect of human nature and is a common first response to change or to something new and different. When people fear change because of its unknown consequences, change is resisted because for them it "…means sacrificing the familiar, even if it is unpleasant, for the unknown, even when it might be better. Better the hole they know rather than the one not yet dug" (Handy, 1989, p. 28).

Many people have good, novel ideas from time to time, but are afraid to try something new, to experiment, or to take a chance for fear of failure, loss, ridicule, or chastisement by someone else. Nature, eons of natural selection, and experience have taught us that safety and security are achieved by staying in

the nest of the routine and the status quo, or by remaining with the pack rather than by stepping out ahead of it. "As is clearly visible today," stated Murphy (1989), "conformity to well established roles is the measure of an individual's integrity. Rebellion is viewed with suspicion…behavior is standardized….Because society operates in a mechanistic manner, initiative is vanquished….it [society] seeks order at the expense of creativity" (p. 14). The adventurer (creative mode) who embarks on a journey into new territory significantly raises his physical, economic, social, or ego risks with little or no safety net to save him should he fail. Many people have not forgotten these "lessons."

3.7.2 Entropy

Entropy, also known as the Second Law of Thermodynamics, is the third major force that results in the resistance of natural systems to change. Entropy refers to the tendency of all systems, given sufficient time, to lose energy and to disperse their components throughout the environment until a state of even distribution, equilibrium, and balance is attained. If equilibrium, once obtained, is upset for some reason, the pressure to enter an entropic condition returns, and remains until equilibrium is once again attained (Serway & Faughn, 1995).

People generally prefer to know and understand what is going on around them. They prefer problems that are solvable, things one can take apart, "and put them together again—the pieces add up" (Gleick, 1987, p. 23). From our finite human perspective, entropic movement often appears to be disordered, unpredictable, discontinuous, and chaotic—we don't see the movement towards equilibrium that is ever-present in the bigger picture. As a result, chaotic situations are generally abhorred, avoided, and resisted (Gleick, 1987; Gregersen & Sailer, 1993). In this regard, Gleick (1987) made the analogy of coping with chaos as being "like walking through a maze whose walls rearrange themselves with each step you take" (p. 24). The history of the progress of the human race, in its lowest common denominator, can be reduced to the never ending quest for the knowledge needed to overcome and control our environments, be they natural or man-made, in an attempt to limit chaos and uncertainty, and thus produce an illusion of order, balance, and sense in our lives

and in our universe. It has been said that knowledge is power, and power is, in human terms, simply the ability to control and influence others and other things (Webster's Third New International Dictionary, 1981), so that we might establish order and maintain equilibrium in our world.

The vectors representing change depicted in Figures 5 and 8 move through a turbulent, viscous environment (Terrberry, 1976). The viscosity (a resistance to movement or flow) of the fluid environment is influenced by a *dynamic tension* that exists between the juxtaposed forces of inertia on the one hand (restraining forces) and entropy (driving forces) on the other (Lippitt, 1973). The nature of the change, and the relative strengths of the driving and restraining forces determine the rate of advancement of the change, its magnitude, and direction. The amount of inertia and entropy present in the environment of a change determines the level of viscosity of that environment, enabling the change to slip through relatively easily when viscosity levels are low and fluid, or hindering the process of change if levels are high and dense. The higher the viscosity level of the environment of a potential change, the longer it will take for it to occur. Sometimes, these factors produce such a level of resistance that they effectively diminish, postpone, or prevent the change from ever taking place. "In organizational terms, a rigid bureaucracy will have high viscosity; it will require more force to overcome inertia just to get moving and, once on the move, slow progress will be made only at the cost of high levels of expended energy..." (Eccles, 1994, p. 14).

By applying a force field analysis perspective (Figure 8), the impetus for change can be viewed as the result of a shift in the balance of strength between the restraining and driving forces that produce inertia and entropy respectively,
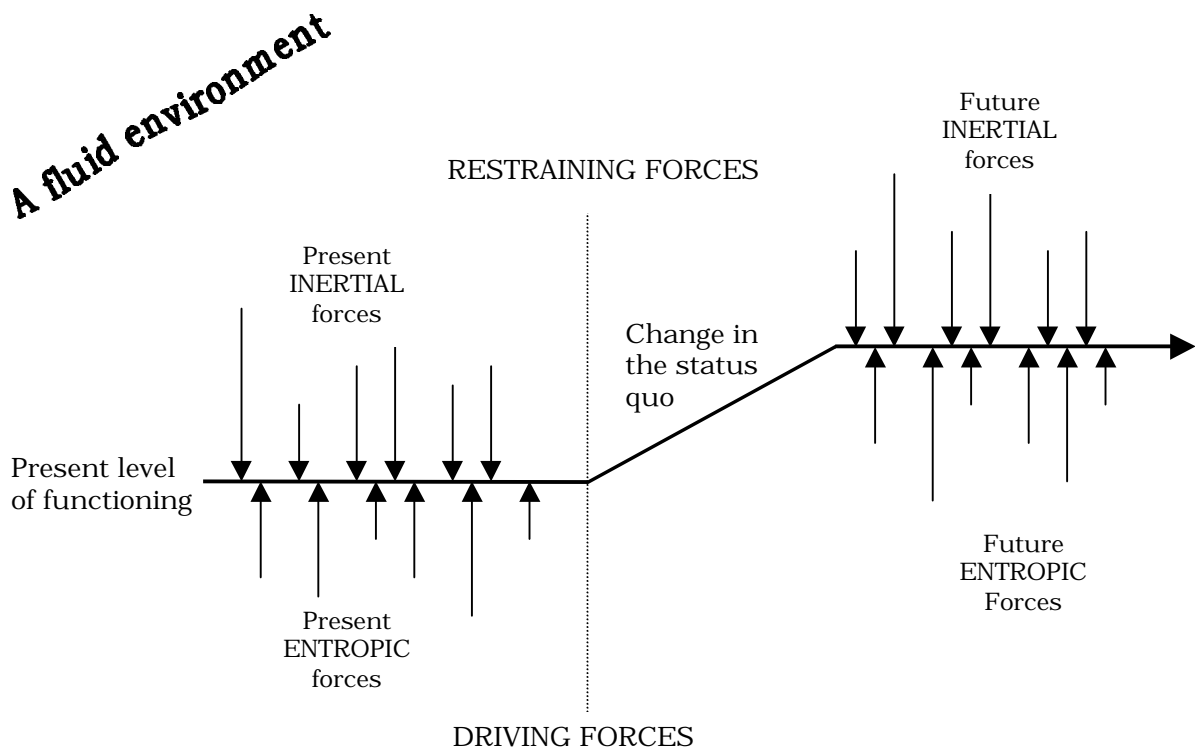
Figure 8. **An application of Kurt Lewin's Force Field Analysis to the dynamic tension that exists between inertia and entropy.** (A modification of a diagram presented in Lippitt, 1973, p. 29)

as they perpetually apply pressure in a dynamic dance for power and influence over an individual, group, organization, or society. Field theory, from which the idea of force field analysis is derived, was originated by Lewin in 1936. Lewin (1951) suggested that any event, product, or process might be thought of as the result of a multitude of environmental factors and forces. Field theory is

primarily "...a method *of analyzing causal relationships and of building scientific constructs.* This method of analyzing causal relations can be expressed in the form of certain general statements about the "nature" of the conditions of change" (Lewin, 1951, p. 45).

The small opposing arrows depicted in Figure 8 represent the variables and contingencies, known and unknown, that are ever present in the changing environment of a person, group, or organization. Whenever a new variable is added to the picture, the individual or organization becomes unbalanced, and something must be changed in order to re-establish the desired steady state (Lippitt, 1973).

While for the sake of simplicity the vectors depicted in the diagrams of Figures 5 through 8 are displayed as single events in a linear format, in reality there are many, perhaps an infinite number of change vectors that overlap, converge and diverge, support or interfere with, and otherwise impact each other's progression through time. This is in essence the concept behind chaos theory, which as previously discussed, states that we can never really know all of the environmental variables, factors, and influences that might impact any entity, system, process, or phenomenon at any given time. It is for this reason that Dunphy & Stace (1993) suggested that leaders and their organizations should have a variety of responses and strategies that are situationally or con-tingency based "...to achieve optimum fit with the changing environment" (p. 905). This is what is commonly known as the *adaptive organization* (Dunphy & Stace, 1993).

3.7.3 Resistance to Change Is a Natural Aspect of the Change Process

Gardner (1995) pointed out that in the process of human growth and development, young children by the age of four or five have already developed well-ingrained "scripts" (views of reality) and stereotypes of how things are or should be. These scripts, he stated, "prove surprisingly impervious to change…" and "…in the absence of any compelling circumstances that are repeated frequently, the growing individual shows little inclination to change" (p. 28).

It is interesting that Gardner used the term *inclinations*, as it is has been established in the fields of anthropology, sociology, and bio-psychology that instincts may affect, and to some degree may even determine, our inclinations or tendencies to behave in certain ways (Garmston & Wellman, 1995; Gould, 1996; Sylwester, 1996). "One of the most significant intellectual events in modern anthropology has been the infusion of evolutionary theory from the biological sciences" (Baba & Zeigler, 1985, p. 3). Sociobiologists, biopsychologists, and behavioral geneticists believe that the combination of hundreds of genes influence and even may in some instances determine human emotions and the inclination to behave in one-way or another. These scientists theorize that all organisms, including human beings, evolved particular behaviors—from instinctive behaviors and patterns to higher order thinking and learning—that provide the best chance for survival and propagation of the species (Postlethwait & Hopson, 1992).

According to Sylwester (1996), many ideas, concepts, facts, and theories emerging from the fields of biology, genetics, and physics combine to make a

strong argument that our brain and body are in reality

> a self-organizing system that draws on its long genetic history and current
> environmental challenges to organize and maintain itself….Natural
> selection can explain many things that we currently view as *taught* and
> *learned.* We are born with a brain that is genetically tuned to the
> environment in which it lives, that is born capable of solving many
> survival challenges. (p. 2)

The resistance to change, therefore, seems to be a universal, natural, and instinctive aspect of human development, with its origins found in the earliest years of life regardless of the culture or society into which one is born. Because of the universality of our inclination to resist change as a first course of action, and the fact that it appears in our species at such an early stage of our growth and development, there may be a genetic proclivity in humans to resist change. As Gardner (1991) described it,

> Children the world over develop comparable theories about the world
> in which they live and the persons with whom they communicate;
> these reflect an interaction between biological inclinations and the
> children's own constructions of the world into which they are born.
> These constraints, the result of hundreds of thousands of years of
> evolution, are very powerful, and, as we will have occasion to see over
> and over again, they prove very difficult to dissolve. (pp. 8-9)

If this "bio-behaviorist" perspective is correct, then the human race's ability to simultaneously adapt to and resist change may have its roots buried deeply in

our species genetic heritage. The idea that there is an inherited genetic tendency in humans to both cope with and resist change is an interesting speculation and is perhaps worthy of future research.

The inclination to resist change manifests in many different ways. Eccles (1994) identified some of the reasons people individually or collectively in groups and organizations resist change:

Ignorance	Failure to understand the problem
Comparison	Solution is disliked, alternative thought better
Disbelief	Feel that solution will not work
Loss	Has unacceptable personal costs
Inadequacy	Insufficient rewards from change
Anxiety	Afraid of coping in new situations or fear of being discovered
Demolition	Risks destroying existing social network
Power cut	Erosion of influence or control
Contamination	Distaste for new values and practices
Inhibition	Low willingness to change
Mistrust	Disquiet about motives for change
Alienation	Low shared values or high alternative interest
Frustration	Reduces political power and career opportunities (p. 67)

Leaders who are planning on implementing a significant change or reform should be aware of these and other possible causes for people resisting change.

They should also know that the tendency to resist change is probably an inherent potential and is likely to occur naturally in every individual and collectively in groups and organizations.

It is not this researcher's intent to go into any great detail concerning successful methods and techniques that have been identified for overcoming resistance to change. There are many books and articles that have been written that address this matter. However, leaders should keep in mind several considerations when trying to overcome resistance in their employees or followers when seeking to implement an effective and lasting change. In their role of change agent, leaders should establish organizational climates that allow and enable their employees to develop the knowledge and skills they will need to adapt to the new circumstances (Fullan, 1991; Senge, 1990). Resistance can be minimized when people have been informed and educated about the nature of the change and why it is necessary. Additionally, they will feel more secure and confident about an ensuing change if they have had an opportunity to participate in determining the course of future events and when they have been given sufficient time to accept and adjust to the new order of things. These and other "coherence making strategies" (Fullan, 1995) help to establish a culture in which most people will feel more capable and comfortable with change.

3.8 Implications of the Change Delineator Theory for Leadership

It is an axiom of today's time that change is occurring at an exponential rate (Drucker, 1995; Evans, 1996; Fullan, 1991; Handy, 1990; Schlechty, 1990; Toffler, 1970, 1980). We are living and working in what has been described as turbulent and chaotic times, where our environment is "…marked by significant discontinuities, and these will be made more significant for us by the fact that there are few remaining economic and cultural enclaves" (Dunphy, 1981, p. 3). The rapidly changing and increasingly interdependent global economy makes each nation, each organization, and ultimately each person more dependent upon and more subject to events, positive or negative that occur throughout the world. For example, the greed and over-zealous borrowing for business expansion on the part of industrialists in several nations of the Southeast Asian rim caused the economies in their countries to virtually collapse during the last months of 1997, necessitating economic bailouts from nations in the West in an attempt to prevent an economic catastrophe. These events and corrective actions are resulting in a cooling off of certain businesses (such as computer chip manufacturers and export dependent businesses) in the interdependent economies of the United States and Europe, negatively affecting business production, sales, and incomes, which in turn are impacting the earnings and continued employment of many individual workers. Thus, seemingly unrelated events that occur in one corner of the world eventually work their way across the globe to directly or indirectly impact the lives of people virtually everywhere.

People, either individually or in groups and organizations, typically make plans and preparations based upon their assumptions, beliefs, and perceptions of what they think or predict is likely to happen (Fullan. 1991; Vaill, 1991). Planning, while not guaranteeing specific outcomes in the strictest sense, generally enables individuals and organizations to have greater control and influence over the future course of events. In reality, planning and predicting depend on the probability of certain events occurring or not occurring. The more that is known about an anticipated event, and the more its variables and conditions can be controlled, the greater is the accuracy of the estimation of whether or not the event will occur, and if it does, how it will take place. The space exploration program, for example, is entirely predicated upon this principle, and although there have been miscalculations and disasters, i.e. the Challenger explosion, man's effort to explore space has been generally successful. With an increased understanding of how and when the event will happen, we improve the accuracy of our planned course of action, our sense of order and control is heightened, and we increase the odds of a successful outcome. This is the essence of the innate problem-solving ability present in all human beings that has enabled our species to survive and thrive in a frequently hostile and physically challenging environment.

Regardless of size or purpose of an organization or institution, to survive and maintain viability, to be able to anticipate, prepare for, and otherwise cope with a hyper-changing environment with some reasonable expectation of success, the researcher suggests that leaders should consider creating and main-

taining organizational climates or structures that not only allow, but encourage and enable their subordinates to spend a greater amount of time and energy in the delineator quadrants of innovation, translation, and creativity. As Senge (1990) worded it, "We must look into the underlying structures which shape individual actions and create the conditions where [certain] types of events become likely" (p. 43). The "events" Senge is referring to are really behaviors such as adaptability, teamwork, life-long learning, personal mastery, shared visioning, and systems thinking—all necessary components of what he calls a learning organization. Leaders have the power to establish the conditions, or structures as Senge (1990) calls them, within their organizations that could empower their subordinates to be more innovative and creative, or to discourage these processes from occurring.

An organization's climate is referred to by Senge (1990) as the organization's "underlying" or "systemic structures" (p. 44). Structures are those factors found inside and outside the organization "that influence behavior [of all employees] over time" (Senge, 1990, p. 44). For example, factors external to an organization such as its customer base, competition, resources, government laws and regulations, national and global economies, etc., combined with structures found within the organization such as the physical plant, employee knowledge and skill levels, interpersonal relationships, operational policies and procedures, leadership styles, and so on—combine to influence or to "generate particular patterns of behavior" (Senge, 1990, p. 45). According to Senge, when people are faced with the same or very similar set of structures, most of them

tend to respond and behave in very similar ways. Leaders, therefore, can establish internal structures—organizational policies, procedures, and practices—that promote creative and innovative thinking and subsequent behaviors among their employees, or they can establish structures that effectively hinder or prevent these processes from occurring.

In reference to establishing such structures, Combs (1988) suggested that leaders create conditions that support open systems thinking, rather than rely on coercion or the use of force. Specifically, he proposed that in an environment conducive to change, people must have opportunities to:

> confront ideas, problems, beliefs, values, goals, objectives, and
> possible alternatives
>
> discover and explore new ways of seeing and thinking in interaction
> with others; and
>
> experiment, make mistakes, modify positions, and try again. (p.39)

While establishing structural policies, procedures, and practices that promote and nurture creativity, innovation, collaboration, risk-taking, and experimentation will not guarantee success, not doing so is bound to reduce the likelihood of long-term organizational adaptability to and viability in an ever-changing environment (Senge, 1990).

There is an old adage that says it takes ten positive experiences to outweigh one negative one. As indicated by Fullan (1991), Senge (1990), and Schlechty (1997), leaders are in the unique position of establishing work environments that encourage experimentation, innovation, and change, or to stifle

these processes. They can establish managerial policies, procedures, and practices that would enable their followers to think and act from their creator or innovator domains. Under such a structure, employees would be allowed and encouraged to take educated risks, to experiment with new ideas, products, or techniques, and to do so knowing that they are reasonably safe and secure, that no negative consequences would be waiting for them should they fail. Staff development and other training programs could be offered that would provide employees with skills needed to increase the likelihood that these activities would produce successful results. Such leadership policies and practices would increase the likelihood that employees would develop a positive self-efficacy for change. "People are more likely to engage in certain behaviors when they believe they are capable of executing those behaviors successfully— that is, when they have high self-efficacy" for the task at hand (Ormrod, 1999, p.133).

Knowledge and use of the constructs found in the Change Delineator Theory may be of assistance to the leadership and management in developing their organization's "capacity to lead change" (Schlechty, 1998). Using the Delineator, leaders can assess where employees are with regard to the four domains of change explained by the theory. As depicted in Figure 9, determining how often employees are functioning in each of the domains of the Delineator may provide leadership with some indication of whether the organization's internal structures—its policies, procedures, and practices—help to promote creativity, innovation, and adaptability to change, or whether they hinder these

processes by encouraging status quo thinking.

Autocratic ◄——— **Leadership style** ———► **Transformational**
(status-quo oriented)   (adaptable, future oriented)

Structure: Boss-centered;
directive; "do it my way";
top-down decision-making

Practitioner
thinking and
behaviors more
prevalent

Innovator

Translator

Creator
thinking and
behaviors more
prevalent

Structure: Transformational;
shared decision-making;
problem-solving bottom-up

High degree of subordination;
adherence to rules; fear of fail-
ure; stifle creative thinking.

High degree of employee support
and cooperation; encouraged to
experiment, invent, take risks.

**<u>Figure 9.</u> Relationship of leadership style and organizational
structures to the Change Delineator Theory.**

As a leader's style moves from the autocratic towards the transformational,
there is increased freedom and opportunity for employees to think and act in
innovative and creative ways to find solutions to the problems they and their
organization face. Schaller (1972) advised:

In the creative organization a deliberate effort is made…to enable each

person to see the organization, its goals, and its problems from the

perspective of the members of the organization. Creativity and innovation

tend to be fostered as people are able to look at the operation of the

organization from a variety of perspectives. (p. 60)

In such an organizational climate, employees are more likely to develop a readiness, capacity, and ability to adapt to an ever-changing environment and to see new possibilities in changing circumstances. They may be less resistant to changes that must be made because they have participated in determining the course(s) of action needed.

If employees are to be empowered to spend more time in their innovator, translator, and creator modes and to subsequently be more involved in the decisions that will affect the future direction of their organization, they must be provided with the knowledge, skills, and time needed to adequately function at those levels of thinking and involvement. Ignorant decision-making is no decision-making at all. In highly adaptable, learning organizations (Senge, 1990) leaders, supervisors, and managers must be willing to take the risk of sharing knowledge and expertise with their subordinates, believing in the synergy of the team, yet knowing that sometimes mistakes will be made. As Handy (1990) worded it

> Learning and changing are never clear and never sure. Whenever we change, we step out a little into the unknown. We will never know enough about that unknown to be certain of the result. We will get it wrong some of the time. Doubt and mistakes must not be allowed to disturb us because it is from them that we learn. (pp. 69-70)

It is often through the process of making mistakes, and through trial and error, that some of the best learning, growth, and development, both individually and organizationally, take place.

The application of the Change Delineator Theory to the workplace may help leaders better prepare themselves, their followers or employees, and thus their organizations to plan for, adapt to, and be more successful in an ever chang- ing, challenging environment.

4. A CASE OF CHANGE: THE COMPUTING SENIORS PROGRAM

4.1 Introduction to the Case

It is the major purpose of this study to propose and validate the *Change Delineator Theory* utilizing an identified case of change. The Change Delineator Theory describes certain capacities of individuals that determine their attitudes, behaviors, and levels of involvement in the process of change. The theory also describes how, on a larger scale, changes spread through organizations and cultures. If there is any validity to the theory, then it should help to explain aspects of change in an identified example of change. The Computing Seniors Program is a case in which change has occurred. As the reader will see, this is a program that has begun to change attitudes, perspectives, and behaviors of school personnel concerning the nature of who are the publics that should be served by public schools.

To set the context and to fully understand the nature of the change(s) brought about by the Computing Seniors Program, we must review the literature on nature of community and its relationship to public schools, consider the aging of America and the resultant demographic changes that our nation is and shall continue to experience for the next 40 or 50 years, and look at some of the characteristics of older people, especially those that concern learning in later life.

The Computing Seniors Program is described in detail, and the roles and perspectives of the parties involved in the program from its inception through its expansion to many other schools are presented. After the case is fully de-

scribed, an analysis of the program is conducted with regard to the four do-
mains (Creators, Translators, Innovators, and Practitioners), the assumptions,
the assertions, and the propositions of the Change Delineator Theory. In this
manner, it will be determined if the theory does describe any aspects of the
change(s) that occurred, thereby validating the theory to some degree. If there
does not appear to be any relationship between the identified case of change
and the theory, then either the Computing Seniors case does not fit the pro-
posed theoretical construct (i.e., it may not be a bonafide case of change), or
the theory may not in fact be an accurate description of the change process.
Certainly, the theory will need to be applied to many more examples of change
or reform and undergo the scrutiny of other students of change to determine its
validity. Finally, a brief discussion of the implications of the Change Delineator
Theory for future research is presented.

4.2 School and Community

4.2.1 Who Is the Community of Public Education?

One of the major school reform movements of the 1980s and for much of the
90s as well, has been the active involvement of parents and other members of
the broader community in the control and decision-making processes of public
schools, typified by the intense interest in and popularity of such movements
as site-based management and schools of choice throughout the country (Mi-
chel, 1997). However, such an interest in parental and public involvement in
schools is not really a new phenomenon. Since its inception, the public school

has been an integral aspect of the community it served, and up until roughly the mid-nineteen hundreds parents and the general public had a great deal of involvement in, concern for, and control over school affairs and governance (Campbell, Cunningham, Nystrand, and Usdan, 1985).

During much of the time period prior to World War II the concept of community was more homogeneous than it is today, with the community of a school generally understood to be grounded in a local geographical area or neighborhood (Merz & Furman, 1997). Many people lived, worked, went to church and school, and spent most of their lives in the same general locality. They spoke the same language, ate similar foods, and shared many beliefs, customs, and traditions. People in such communities knew each other and each other's business, and cared about each other and about what went on in their schools. The public school during this era was an extension of the home, church, and local economy (Campbell, Cunningham, Nystrand, and Usdan, 1985). Today, the "community" of a typical public school is a very different entity.

4.2.2 Conceptualizing Community

The term "community" is a key concept in the literature of sociology and education. As a result of the diversification and segmentation of our society that has occurred during last fifty years or so, it has come to mean many different things. Community may be used to refer to a geographic area or to an area of functionality as in the sense of a "farming community" or a "business

community". It may be used to describe a homogeneous group or a diverse one. A community might be formed around a value or a belief system as in a "religious community," or it can be economically, politically, culturally, or ethnically based. A community may also be internal or external to an organization (Merz & Furman, 1997). For the purpose of this study the term *community* is used to simply mean any "collection of individuals who are bonded together by natural will and who are together [bound] to a set of shared ideas and ideals" (Sergiovanni, 1994, p. xvi). Members of a community consider themselves as a "we," sharing personal and meaningful values, sentiments, traditions, and relationships that serve to sustain the sense of community. Members of a community generally value highly those things that bind them together and work to ensure that their community perseveres and prospers. Such communities— groups, organizations, institutions, and other formal or informal components of society—and their interests, over-lap and interconnect in varying degrees.

For much of the early history of the nation, "…communities were highly homogeneous, and values were shared widely (Merz and Furman, 1997, p.5). The local school was often thought of and served as one of the main hubs of the community, what Schlechty (1990) called the "tribal center" (p. 18). After World War II, the traditional picture of community in the United States began to change rapidly due to many factors, including, but not limited to, the rapid growth in the population; migration of persons to the Northern and Western sections of the nation; advances in communications, transportation, housing, and technology; and the combined impact of these on the economy (Campbell,

et al., 1985; Merz and Furman, 1997). More specifically affecting the loss of a sense of community for local schools has been desegregation, racial balancing, forced busing, redistricting, the development of schools of choice and magnet schools, the growth of suburbs, and the highly mobile nature of today's life styles.

Today, our sense of community is, like so many other human relationships, a more temporary aspect of the lives of many people than it was in years past. As Drucker (1995) explained it:

> …the essence of a knowledge society is mobility in terms of where one lives, mobility in terms of what one does, mobility in terms of one's affiliation….People no longer have 'roots.' People no longer have a 'neighborhood' that controls where they live, what they do, and indeed, what their 'problems' are allowed to be. (p. 251)

With the demise of the traditional community and the valuable services it provided to its members, Drucker asked, somewhat rhetorically, "Who then is concerned with the common good" (p. 265)? In many localities, the answer to this question may be found in the neighborhood school.

As a result of the loss of the traditional sense of community, the mobility of the population, and the social, technological, and economic changes that have occurred since World War II, the institution of the public school is increasingly expected to provide services that go far beyond its primary historical purpose of educating the nation's youth. Many schools are now providing for the health, welfare, nutritional, and security needs of children and families that were here-

to-fore provided by families, churches, and civic organizations that were for-

merly active and involved components of traditional communities. For many

people, the twelve years they spend in school provides them with a level of

caring, nurturing, and socialization that goes far beyond the traditional role of

the public school of simply providing them with an academic or vocational edu-

cation. Throughout the nation, people who move from one area to another are

likely to encounter public schools that are fairly similar and consistent. Even

though names and faces may vary from building to building, schools generally

have much in common, providing a level of assurance and security available in

few other institutions (Goodlad, 1984; Sarason, 1990). "Schools may be one of

the last vestiges of such [caring] organizations as we tend to turn over more

and more of our social and civic responsibilities to the state or to large bureau-

cratic organizations" (Merz & Furman, 1997, p. 32).

As depicted in Figure 9, public schools interact directly or indirectly with

many diverse special interest groups or "communities" (Michel, 1997). Because

education is so critical to the success of many of these communities, they ex-

change information, money, support, values, beliefs, and other resources with

schools as they vie for influence, power, and control over the content and out-

comes of public education.

Ironically, while many schools provide a wide range of services, and must

do so in order to ensure that their students are ready and capable of learning,

schools are primarily held accountable by society only for the level of academic

success of their students. "One of the major reasons for the steady decline in

its capacity to do its own job, that is, to teach children elementary knowledge
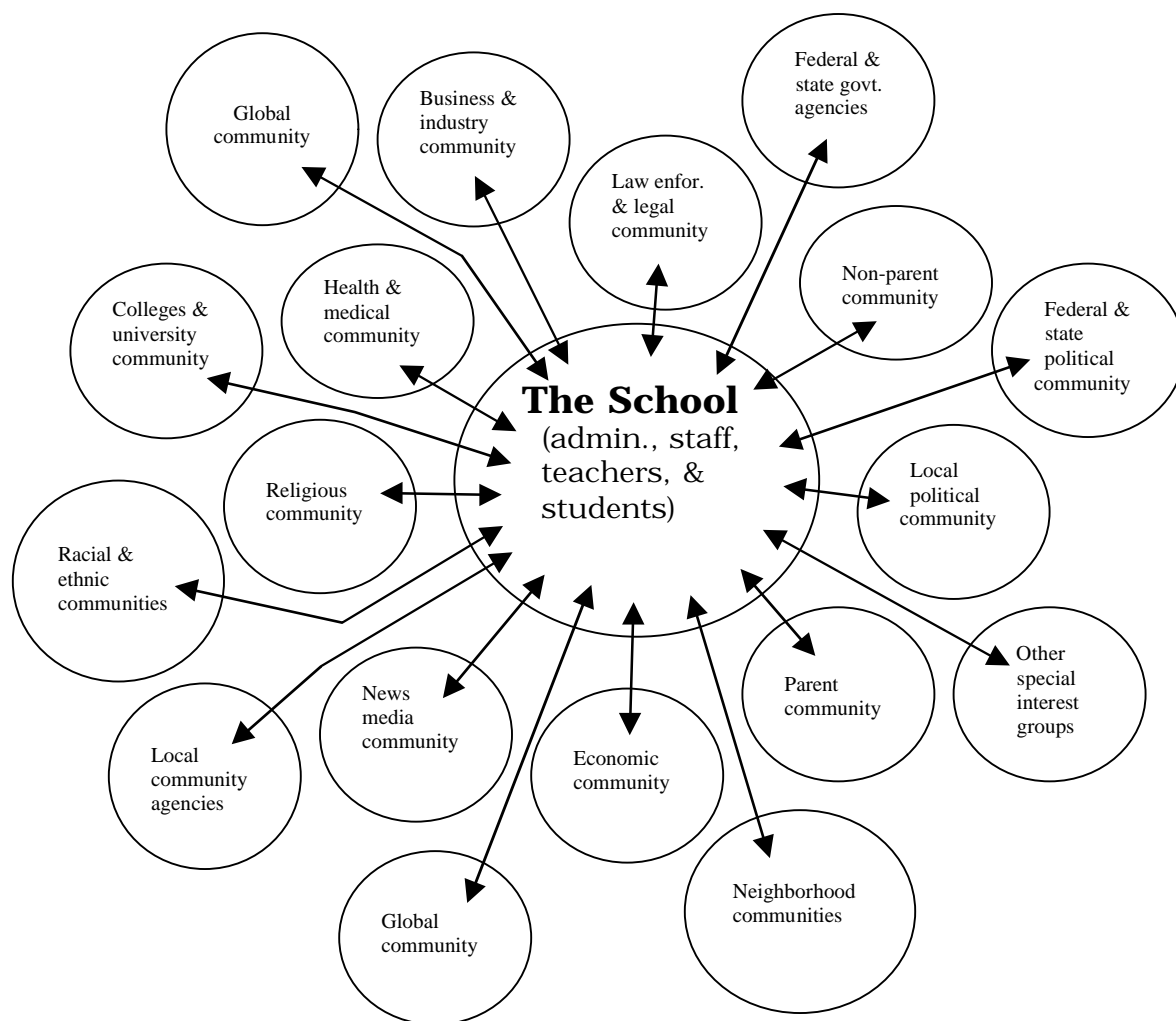
Figure 10. Many "communities" interact with schools as well as with each other.

skills," proclaimed Drucker (1995), "is surely that, beginning in the 1950s, the United States has made the school increasingly the carrier of all kinds of social policies….[this has] without a doubt, severely impaired its capacity to do its own job" (p. 266-267). So it would appear that public schools are faced with a

paradox. They are primarily held accountable for student academic perform-ance, yet, at the same time, schools are also expected to attempt to fulfill a so-cial and economic agenda that often takes time, energy, and resources away from academic programs and the goal of educating the nation's youth.

4.2.3 The School as a Social "Organism"

Schools are *social systems*, inventions of the human mind, designed to pass the knowledge, values, experiences, and heritage of the culture in which they exist from one generation to the next. "A social system," explained Katz and Kahn (1978), "…is a structuring of events or happenings rather than of physi-cal parts and it therefore has no structure apart from its functioning….Social systems are anchored in the attitudes, perceptions, beliefs, motivations, habits, and expectations of human beings" (p. 37). The school and all other social systems are in actuality "open systems," as are all biological systems and or-ganisms. Any entity that is an open system can only survive so long as it is capable of interacting with and conducting "energic" transactions between itself and its environment (Bennis, Benne, Chin, and Corey, 1976; Katz & Kahn, 1978; Terreberry, 1976). "Energic" is a word coined by Katz and Kahn (1978) to describe the input and output energies and other resources exchanged in their model.

According to Katz and Kahn (1978), all organizations within a society must interact with the various communities and other non-human factors found in their environments, receiving information, values, materials, and other re-

sources (*energic inputs*) with which they manufacture or produce (*energic trans-*

formations) a product or provide a service (*energic outputs*) that is valued,

needed, or otherwise desired by the broader society (environment). As depicted

in Figure 11, this process is cyclical in nature and like a living creature, so long
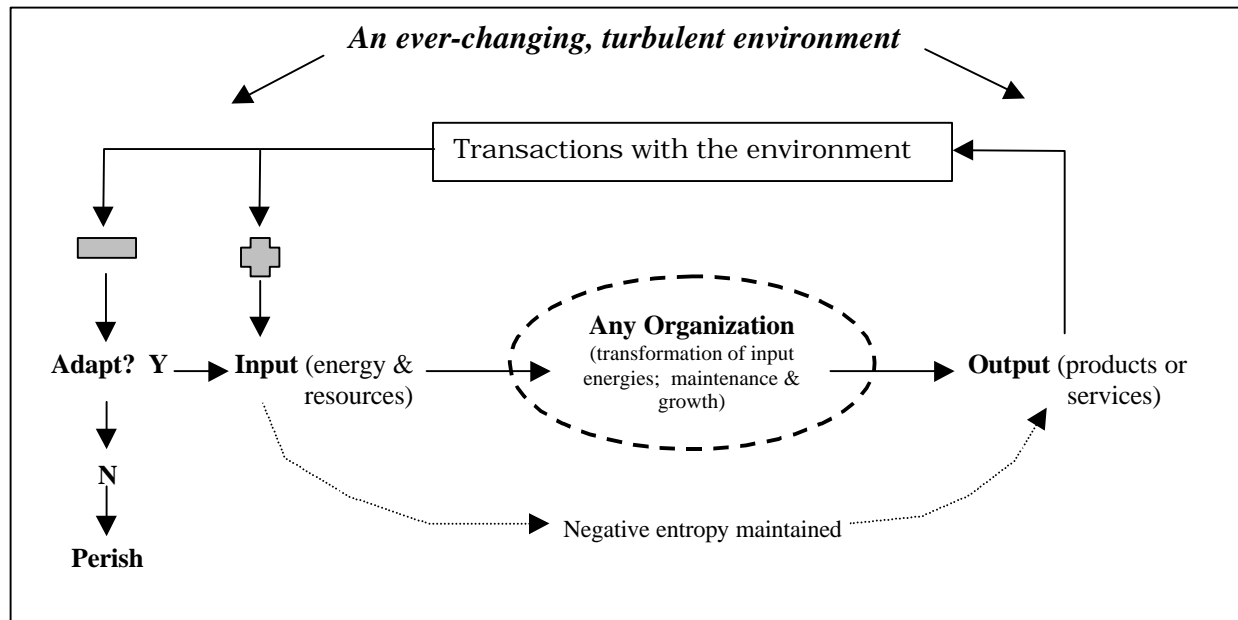
(Adapted from Katz & Kahn's (1978), "Energic Input – Output" model of organizational life and
Terreberry's (1976) "Integrative Framework model)

Figure 11. **Biological cell model of an organization.** Organizations gen-
erally survive so long as their exchange cycle remains positive.

as the organization can obtain the inputs it needs to produce its product, it is

likely to survive. However, if the environment changes and the organization

does not change and adapt to the new circumstances, it might not receive the

kind, quality, or quantity of inputs it needs, or its output might no longer be of

value to the society, resulting in a breakdown of the cycle and the possible de-

mise of the organization (Katz & Kahn, 1978; Terreberry, 1976). This results

in a perpetual state of dynamic tension existing between the organization, which wants to keep itself in a stable condition by maintaining a rudimentary equilibrium or steady state between its inputs, outputs, and its environment which tends to be entropic, ceaselessly moving towards dissolution, disconti-nuity, and randomness (Bennis et al. 1976).   It takes a consistent and suffi-cient infusion of energy and other resources for open systems to maintain themselves in the face of omnipresent entropic pressure. Katz & Kahn (1978) call this state or condition that living organisms or organizations seek to obtain one of *negative entropy*.

While Figure 11 represents the input-output cycle of a single organization, in reality the environment of any organization contains an innumerable quan-tity and variety of individuals, groups, and other organizations that are inter-acting with or impacting each other positively or negatively to varying degrees, not unlike the creatures to be found in virtually any ecological niche. Terre-berry (1976) and Dunphy (1981) call this the "turbulent environment" of an open system. Turbulence is a product of the uncertainty and unpredictability that is brought about by rapid change, which results in tension, stress, strain, conflict, and problems between the organization and the various entities and components found within its environment.   The environment of groups and or-ganizations "…will be marked by significant discontinuities, and these will be made more significant for us by the fact that there are fewer remaining eco-nomic and cultural enclaves…" stated Dunphy (1981), for "…we are now part of an interconnected, international economy where there will be increasing dis-

ruptions, and where disruptions in one area affect others" (p. 3). Rapidly changing social, technological, and economic environments are forcing organizations to learn about and adapt to an ever-changing array of contingencies to enhance their survivability in such turbulent conditions.

Schools are also faced with turbulent conditions, and can only achieve negative entropy and remain generally balanced (maintain a state of equilibrium) so long as they continue to obtain adequate resources from and meet the output needs and expectations of the communities that support them. "Organizations survive when they meet social needs; they die when they do not" (Minzey & LeTarte, 1994, p. 158). If a school fails in this regard, it will become increasingly less valued by the community, fiscal and psychological support will decline, and it may cease to be a viable organization in the community it was created to serve. "The public will not financially support the schools (taxes) unless it morally supports the schools, i.e., sees a value resulting from its tax dollars related directly to its welfare" (Virginia School Boards Association, 1997, p. 2). Examples reported in the news media in recent years of such a loss of public confidence and support for schools can be seen in the demise of districts such as those in Newark, Paterson, and Jersey City, New Jersey; Detroit, Michigan; Baltimore, Maryland; Cleveland, Ohio; and Chicago, Illinois, districts in which local school boards were dissolved or placed under the operational authority of their respective state boards, city councils, or private management corporations (Archer, 1999; Sandham, 1999). "The level of frustration with schools is so great…" claimed Schlechty (1997), "…that increasing

numbers of citizens seem willing to seriously consider solutions that if enacted would lead to the abandonment of America's commitment to public schools" (p. 3). While the loss of community support is not the only reason for this lack of confidence in and support for public schools, it can be a major contributing factor. Schools must change and adapt to meet emerging community needs, or they may perish as the institutions we now know them to be. A growing area of need is in the provision of educational and related services to older citizens of a school's local community.

4.2.4 The Nature of Community

Ideas central to understanding the social relationships involved in the concept of community are represented by the German terms gemeinschaft and gesellschaft, which are loosely translated into English as "community" and "society" respectively (Sergiovanni, 1994). These terms are mentioned frequently in the literature regarding community (e.g. Merz & Furman, 1997, Sergiovanni, 1994, Gallagher, and Bagin & Kindred, 1997). Simply stated, gemeinschaft connotes a sense friendship, neighborliness, caring, and belonging, a "we" mentality that shares values, beliefs, and points of view. In gemeinschaft communities it is considered normal that commitments between people (e.g., helping others in a time of crisis or emergency) are unstated, inherently understood, taken for granted and expected. Relationships, position, and status are more or less inherited; they overlap, are diffuse, and are almost tribal in nature. Gesellschaft on the other hand, is more of a "they" or "them" mentality,

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where relationships are more temporary and voluntary, based on rationality, personal will, and functionality. Gesellschaft communities are more impersonal, secular, bureaucratic, calculating, regulated and institutionalized. People come together in such communities for mutual advantage, are goal oriented, competitive and exploitive, as in business and commerce. Status is determined by competency and position in an organized hierarchy. Too many public schools, suggested Sergiovanni, tend to be more gesellschaft than they are gemeinschaft. Ironically, it is a gemeinschaft atmosphere that is more likely to produce the kind of open and supportive school environment that research has identified as a critical ingredient in developing and maintaining an effective school.

Because of their warmth, caring, collegiality, cooperativeness, and altruism, gemeinschaft communities tend to be *intergenerational,* valuing the knowledge and experience of their older members. "Older people are inspired by the innocence and hopefulness of the young," stated Boyer (1991), "…while children, through close and cordial involvement with their elders discover roots and gain confidence to make their way through life" (p. 109). Gesellschaft communities, because of their individualistic, impersonal and competitive values are more likely to produce isolation and feelings of disconnectedness among members, and tend to be age-segregated. Once a person is no longer perceived as being able to produce value for other members of a gesellschaft community or institution, they are typically pushed aside, forgotten, or abandoned. If, as suggested by Boyer (1991), Merz & Furman, 1997, and

Sergiovanni (1994), to be more effective, schools must become more gemeinschaft, they will need to reach out to all segments of their communities, including older adults. Unfortunately, while professing to be proponents of life-long learning, in classic gesellschaft tradition many, if not most public schools, have generally ignored the educational needs and involvement of the oldest segments of their communities—senior citizens. "Clearly, the time has come to break up the age ghettos. It is time to create new intergenerational arrangements….Let's have institutions that bring the old and young together, with facilities and programs that intersect" (Boyer, 1991, p. 113). What is needed, suggested Boyer, are educational programs that actively promote "connections across the generations" (p. 113).

5. WHY SCHOOLS SHOULD INVOLVE AND SERVE OLDER PERSONS

5.1 Demographics of an Aging Population and Implications
for Public Education

*"The older population as a proportion of total population has
triptled in this century"*   (U.S. Department of Health and
Human Services, 1991, p. 2)

During the later half of the Twentieth Century the United States began ex-
periencing some significant changes in the composition of its general popula-
tion. According to the U. S. Bureau of the Census, the population increased
over the last 40 years from just over a 150 million in 1950 to approximately
250 million in 1990, and is projected to be about 275 million by the turn of the
century. During this period, two significant population factors have and will
continue to dramatically alter the demographic, political and economic land-
scape of the nation. First, despite record numbers of children being born (e.g.
"baby boom" years, 1946 - 1962) and attending public schools, the birth rate
has been slowly but steadily declining, going from a rate of about 23.7 births
per thousand population down to about 16 per thousand in 1992. While the
average American family had 3.7 children per family in 1950, this number had
declined to fewer than 2 children per family by 1990 (Aging America, 1991).
Secondly, due to improved nutrition, health, and medical care, people are living
longer, resulting in a concurrent declining death rate (see Table 1), projected to
decline until around 2010 when it will begin to rise again slightly as the
"boomers" enter the years of life when death naturally increases. People are

living longer and more active lives than ever before in our history, with the average life span for all persons increasing from about 68 years in 1950 to almost 76 years in 1995. According to the U.S. Census Bureau's projections this trend is expected to continue for the next 50 years or so, and if it does the median age of the average American (for all genders and races combined) will have increased to 43 years by 2050 (U.S. Department of Health and Human Services, 1991). [2]

Table 1

Birth and Death

Rates, 1950-2050.

(per 1000 population)

Note. Data from 1950-1995 is from the 1998 World Almanac Book of Facts, (p.62), Mahwah, NJ: K-111 Reference Corporation; Data from 2000–2050 is from Statistical Abstract of the United States, (p. 76), by U.S. Bureau of the Census, 1998, Washington, DC: U.S. Bureau of the Census.

YEAR	BIRTH RATE	DEATH RATE
1950	24.1	9.6
1960	23.7	9.5
1970	18.4	9.5
1980	15.9	8.7
1990	16.7	8.6
1995	14.8	8.8
2000 *	14.2	8.8
2010 *	14.3	8.9
2020 *	14.2	9.5
2030 *	13.9	9.5
2050 *	14.4	10.1

*projected

Older adults, seniors, elders, or elderly are terms used interchangeably in the gerontology literature to loosely describe anyone over the age of about 55 years. Some sources consider the elderly as anyone aged 65 or higher, as 65

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[2] Projections by the Census Bureau are based on certain assumptions about fertility, death, and immigration rates. Three levels of projections are typically offered based upon low, medium, and high mortality rates and other assumptions. As much as possible and when known, data forecasting that is presented in this study utilize the medium level of assumptions.

has been considered the traditional retirement and Social Security age for the past sixty years (Conner, 1992). Seniors aged 55 and over made up about 21 percent of the population in 1995, and are projected by the Census Bureau to steadily increase to about 33 percent of the total population within the next 30 years (U.S. Department of Health and Human Services, 1991). During this same period the percentage of the population aged 17 and under is forecast to decrease slightly, but will remain at approximately 25 percent of the total population (see Table 2).

Table 2

Projections of Total Population, by Age, 1995-2050. (in thousands)

	1995		2000		2010		2030		2050	
	Population	Percent	Population	Percent	Population	Percent	Population	Percent	Population	Percent
Totals	262,820	100	274,634	100	297,717	100	301,072	100	393,931	100
Age Range										
0-17 years	68,742	26	70,782	26	72,511	24	65,535	21.8	96,117	24
18-34 years	65,789	25	63,491	23	68,430	23	71,423	23.7	85,698	22
35-54 years	73,606	28	81,689	29	82,085	27	75,297	25.0	90,887	23
55-64 years	21,139	8	23,961	9	35,283	12	32,948	10.8	42,368	11
65 and over	33,543	13	34,709	13	39,408	13	58,869	19.5	78,859	20

Note. A compilation of data obtained from World Almanac Book of Facts, 1998 (p. 386), Mahwah, NJ: K-111 Reference Corporation, and the Statistical Abstract of the United States, (p. 17), U.S. Bureau of the Census, 1998, Washington, DC: U.S. Bureau of the Census. Table modified and some percentages do not equal 100% due to number rounding.

The combination of the declining birth and death rates with the graying of America as baby-boomers (currently about 33% of the total population) begin crossing the fifty-five year mark in record numbers in the early part of the next century, will have serious implications for the entire country and especially for

public education (see Table 3). One of the most significant of these will be

the drastic change in what demographers, sociologists and economists call the

dependency or *support ratio.* The dependency ratio is a comparison of the

number of the non-working youth (those 20 years old or less; known as the

 "youth dependency ratio") and older persons who are no longer employed

Table 3

**Percentage of Population
55 Years + .**

(Source: U.S. Department of
Health and Human Services as
reported in <u>Aging America</u>:
Trends and Projections (p. 7), U.S.
Department of Health and Human
Services, 1991, Washington, DC.

Year	Percent	Year	Percent
1950	16.9	2000	22.0
1960	17.9	2010	26.4
1970	19.0	2020	31.7
1980	20.9	2030	33.4
1990	21.1	2050	35.2

(generally those 65 and older; known as the "old-age dependency ratio" or the

"elderly support ratio") per 100 working adults aged 20 to 64 in the population.

The taxes paid and the purchases made by working adults support the nation's

economy, government, Social Security, many pensions, and other social-welfare

services. The major shift in our country's population towards a higher per-

centage of elderly will dramatically alter this ratio with far-reaching implica-

tions for all of society's institutions (Conner, 1992). As the senior population

increases in proportion to the general population, the relative percentage of the

younger generations decreases as depicted in Table 4. It is estimated that the

dependency ratio will be about 60:100 in the year 2000, and will increase to

approximately 75:100 by the year 2050 if current trends continue (see Table 5).

The support ratio gives demographers and planners a rough idea of the economic burden non-workers place on those who are employed. While the numbers indicate that the nation has had similar high support ratios in the

Table 4

<u>Percentage Comparisons</u>
<u>of Persons Age 55 or More to</u>
<u>Youth Age 17 or Less (as a % of</u>
<u>Total Population), 1900-2025.</u>

(Source: <u>Statistical Abstract of the United</u>
 <u>States</u>, (compilation of data from pages
15 and 25) U.S. Bureau of the Census, 1998,
Washington, DC: U.S. Bureau of the Census.

Year	Percent 55 +	Percent 0 – 17
1900	9.3	40
1950	16.9	32
1970	18.9	34
1980	20.9	28
1990	21.1	26
1995	21.0	26
2000	21.4	26
2005	23.0	25
2010	25.2	24
2025	30.3	25

Table 5

<u>Young, Elderly, and total</u>
<u>Dependency Ratios, 1900-</u>
<u>2050 (Number of People of</u>
<u>Specified Age per 100 Peo-</u>
<u>ple Age 18 to 64).</u>

(Source: <u>Aging America: Trends</u>
<u>and Projections. (</u> p. 18), by U.S.
Department of Health and Human
Services, 1991, Washington, DC:
U.S. Government Printing Office.

Year	65+	Under 18	Total
Estimate			
1900……………	7	76	84
1920……………	8	68	76
1940……………	11	52	63
1960……………	17	65	82
1980……………	19	46	65
Projections			
1990……………	20	41	62
2000……………	21	39	60
2010……………	22	35	57
2020……………	29	35	64
2030……………	38	36	74
2040……………	39	35	74
2050……………	40	35	75

early part of this century, it should be noted that at that time there was a much higher percentage of persons living and working on family farms who consequently did not place a significant financial burden on the nation. Secondly, Social Security payments and the supporting FICA taxes did not exist until 1935. Payroll tax-supported Medicare did not come into existence until July, 1966. Today, those who are employed are paying a much higher percentage of their gross salary to support those youth and elderly who are not working than workers did prior to the "New Deal" era of the 1930s and 40s. As Conner (1992) worded it, society should be anticipating and planning for…

> …the day when there will be decreasing numbers of working adults supporting an increasing number of older dependent adults. The expanded population of older adults will require increased pension and retirement benefits, health care that focuses on the diseases of older adults, housing and transportation designed for senior citizens, and other services that address the needs of elderly Americans. Since society's resources and its social policy will be increasingly focused on the needs of the expanding elderly population, fewer resources may be available to prepare the young for their future roles. (p. 13)

While it is difficult to predict what the outcomes of fewer workers supporting such a large dependent group might be, it is probably safe to say that the

competition for funds to pay for tax-supported public services may become fierce. Research has shown that older persons are much more likely to vote than are those in their 20s and 30s (Conner, 1992). Through the power of the vote, future political decisions are likely to be proportionately skewed towards the interests, concerns, knowledge, and beliefs of older persons. For this reason it is imperative that older people have good knowledge of the events, needs, and state of affairs of their local community, our society and the world so that they can make well thought out decisions in the voting booth that will be in their best interest as well as that of the entire nation. Public education will be significantly impacted by this changing demographic picture in many ways, and will no doubt increasingly feel the political and economic pinch as the population and power pendulums swing towards the aged in the early part of the next century.

5.1.1 The Non-parent Community

Another important aspect of the aging of American society is the growth in numbers, power, and influence of the non-parent segment of the nation's population. If birth rates continue to remain below the replacement level as the population steadily ages for the next several decades, there will be a proportionate and significant increase in the *non-parent* segment of the community, regardless of their age. Non-parents are those adults, voters, and taxpayers who either have never had children or whose children are no longer of public school age. The number of families that have no children of their own has

risen from 44 percent of all families in 1970 to 51 percent in 1995 (U.S. Bureau of the Census, 1996). This family data combined with the number of elderly in our population (for whom it can be safely assumed that the vast majority do not have school age children in their households), results in an estimated non-parent population of somewhere between 64 to 72 percent of the total population, with Minzey & LeTarte(1994), claiming that the number may be as high as 80 percent of the total adult population.

For many years, most citizens in our society, whether they have had children or not, have historically recognized and supported the need for a free public school system to educate the nation's youth. However, as the non-parent community increases in size, power, and influence, there is an increasing likelihood that their interests, needs, and priorities will shift away from a concern for the education and well-being of children and youth, and will move towards seeking, funding, and otherwise supporting services designed to fulfill the needs and desires of a childless and aging population (Decker & Romney, 1992; Minzey & LeTarte, 1994).

If institutions such as the public school do not take these changing demographics and resultant political and economic implications into consideration, they are very likely to encounter difficulty in maintaining adequate community support. "We face in this country a growing gap between old and young…" professed Boyer (1991). "…Some senior citizens have organized to protect their own special interests, often to the detriment of children" (p. 120). As pointed out previously, if the energic input/output equilibrium state is altered and the

school does not adapt to better accommodate the changes in its environment, it will lose public support and ultimately maybe even its existence (Katz & Kahn, 1978). "There appears to be a rather direct relationship between changed demographics and the growing difficulty of securing tax dollars for schools…", stated Goodlad (1984), "…Our public system of schooling *requires for its survival,* [italics added] to say nothing of its good health, the support of many not currently using it, and that support is in doubt" (p. 2).

Thus, if public education is to remain a viable institution in society, it would seem prudent and wise that local schools begin to consider ways of adapting to the changing demographics resulting from the aging of the general population. "Politically, educators will need to inform, involve, and serve more people beyond school age," recommended distinguished participants of a Delphi study sponsored by the American School Boards Association "…since growing numbers of homes no longer have students in school" (Uchida, Cetron & McKenzie, 1996, p. 55). "If schools do not pay more attention to their education problems, then they [non-parents, including older persons] are not likely to provide the financial support to the schools' kindergarten through twelfth-grade functions" (Minzey & LeTarte, p. 85). Public schools need to become more inclusive (gemeinschaft) and should expand their vision of who is their public to be served to include grandparents, older neighbors and senior citizens of their communities. If they do so, schools are likely to continue to receive economic, political and other kinds of support from this segment of the community they need to survive.

5.2 Some General Characteristics of Older Persons

While numbers may vary considerably at the local level, a large segment of the non-parent community is comprised of senior citizens. If schools accept the challenge of expanding their definition of the public served to include older persons in their educational offerings, then school personnel need to gain a rudimentary knowledge and an understanding of the unique physiological, intellectual, and social capabilities, as well as the problems and needs, of this group of people.   As there has traditionally been very little involvement with seniors on the part of schools, educational research consultant Susan Black (1997) believed that "…few administrators and teachers know much about the research on adult learning or about the "best practices" that researchers agree should be the foundation of every adult education program" (p. 40). Such information is crucial to developing and conducting effective educational programs designed to meet the learning needs of older students.

Although seniors are generally considered to be everyone above the age of 55 years (Peterson, Thorton & Birren, 1987), there is a tremendous amount of variation in the physical, social, emotional, cultural, educational, and intellectual experiences and abilities within this diverse group of individuals, as well as significant economic and life style variations. An individual who is, for example, in his or her late fifties may be physically and mentally more similar to someone twenty years younger than they are to a person who is in his or her late seventies.

Due to the increased longevity and the wide range of heterogeneity within

the older population, gerontologists (researchers who study the process of ag-

ing and the characteristics of older persons) generally categorize them into four

groups: the *early seniors* (age 55 to 64), the *young old* (aged 65 to 74), the *old,

old,* (those from 75 to about 85 years of age), and the *oldest, old* (those 85 and

over) (Lowy & O'Conner, 1986; Conner, 1992).

    There is a great deal of variance in the physical, mental and other abilities

and characteristics among persons from one age range to another, and even

between one individual to another within an age range. Despite this diversity,

society tends to lump all older persons together under the single, all encom-

passing concept of "old age", which is often associated with negative stereo-

typing, devaluing, prejudice, and resultant discrimination against older per-

sons. These attitudes and behaviors are commonly known as *ageism* (Moody,

1988; Conner, 1992; Glendering & Stuart-Hamilton, 1995). "The stereotyping

is all the more remarkable…" stated McDonald (1995), "… because it encom-

passes such a wide range, with anyone aged fifty-five years and over being con-

sidered a legitimate target" (p. 99). According to Moody (1988) these long-held

negative images have resulted in two things happening:

> First, our social policies for helping older people tend to overlook
>
> contributive roles that older people can play. And second, our policies for
>
> developing and nurturing strengths are skewed toward childhood and
>
> youth. Later life is ignored, as if growth and change were impossible.
>
> (P. 3).

Therefore, to avoid such negative pigeonholing, in any discussion of the

characteristics and traits of older persons or in developing plans or programs for seniors, it should be emphasized that we are speaking in the broadest of generalizations.

With this caveat in mind, gerontologists have been able to determine certain conditions that are likely to be encountered by most persons as they age from their early senior years into the later years of about 85 to 90 and older, although no one can accurately predict for any individual exactly when or if the conditions might actually be experienced. Generally speaking, as compared to younger adults, older persons are more likely to:

1. Have a lower metabolic rate and less energy;

2. take longer to heal and repair cellular/tissue damage;

3. experience reduced vision and hearing capacities;

4. have a slower response time to physical stimuli;

5. be less tolerant of rapid changes in light intensity;

6. have poorer eye-hand motor coordination, especially bi-manual;

7. be in poorer physical conditioning and have less physical strength;

8. have more infirmities such as high blood pressure, arthritis, heart disease, osteoporosis, dementia, and other debilitating conditions.

   (Peterson, 1983; Lowy & O'Conner, 1986; Peddie, 1994)

As this study is primarily concerned with the inclusion of older persons in the educational environment of the public school, there is no need to go into great depth concerning all of the health and physiological characteristics, conditions, and problems of aging—volumes have been written about that. There

does, however, need to be a brief discussion of the impact the process of aging has on older persons' intellectual abilities, learning needs, and the subsequent instructional implications, although it should be kept in mind that for many seniors their learning ability is directly impacted by one or more of the aforementioned conditions.

5.3 Learning in Later Life

It used to be thought that the majority of brain growth and development occurred up to about age 3, with the process slowing but continuing up to about age 6, after which time a typical human being had virtually no additional brain development. One's intelligence remained fairly stable through roughly mid-life, after which time it was believed to slowly but steadily decline until death (Lowy & O'Conner, 1986).

Today, thanks to advances in aging research and technologies such as magnetic resonance imaging (MRI), scientists now know that the brain maintains its plasticity throughout most of a person's lifetime. According to Marian Diamond, Professor of Anatomy at the University of California at Berkley, through mental use and stimulation additional neural synapses and connections called *dendrites* continue to grow and connect brain cells to each other in the cerebral cortex, the area of the brain that deals with higher cognitive processing. Without such stimulation, there is little or no dendrite development. It is now believed it is these connections that form the neural network that determines a person's intelligence. "Increases in cortical growth as a conse-

quence of stimulating environmental input have been demonstrated at every age," stated Diamond, "…including very old age" (1997, p. 10). So it would appear that in human beings, we literally seem to have a "use it or lose it" situation when it comes to maintaining our intellectual abilities (Diamond, 1997).

Theoretically then, as long as one remains healthy and intellectually active, with no signs of genetic, vascular, or other disease induced dementia, there should be no significant brain deterioration. In fact, it now appears that a person's general intelligence may continue to grow and develop throughout most of one's lifetime (Diamond, 1997; Denny, 1979; Willis, 1985). Based upon gerontological research, claim Glendenning and Stuart-Hamiliton (1995), we…

> …can now say with growing certainty that intellectual and cognitive performance in old age is to a large extent, dependent on a person's educational history and the constant use of their cognitive facilities over the years….The paradigm of enfeeblement, pessimism, and inevitable decline are shifting to those of creative activity and self-fulfillment, and to those of searching for stability in cognitive development, even the learning of new tricks. (p. 20)

It is no longer considered an absolute for every individual that general intelligence and the capacity to learn decline with age. However, there are certain aspects of intellectual functioning that gerontologists agree are likely to change and appear to decline for many individuals as a they age. Whether or not this decline in certain kinds of intellectual capacities is a natural and universal biological function of the aging process or if it is en-

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vironmentally induced is not really known at the present time. "It is important to bear in mind…" stated Willis (1997), "…that decline is an intra-individual phenomenon….Age-related cognitive decline is selective. There are wide individual differences in the particular abilities that show decline for a given individual" (p.124).

5.3.1 Specific Factors Affecting Learning in Older Adults

In discussions of human intellect, psychologist and gerontologists are primarily concerned with two forms of general intelligence known as fluid and crystalline, terms originally coined by Horn & Catell in 1966 (Lowy & O'Conner, 1986). Fluid intelligence is that which involves short term memory, conceptualization, the ability to perceive complex relationships, and other so-called higher order, abstract thinking processes. Crystalline intelligence is cumulative, is based upon such things as vocabulary and life experience, and involves long-term memory. Fluid and crystallized intelligences combined produce a person's general intelligence. Some authorities believe that there may be a decline in fluid intelligence with age, while crystallized intelligence may actually increase, resulting in a stable, yet somewhat different general intelligence as one ages (Lowy & O'Conner, 1986; Moody, 1987; Glendenning & Stuart-Hamilton, 1995).

Lately, other experts are finding that with appropriate training and stimulation, fluid intelligence can actually be increased in older persons

who, for whatever reasons, have not sufficiently "exercised" this form of brain function in their later years (Willis, 1997). Peterson (1983) concluded:

> It is now recognized that intelligence does not universally decline after young adulthood and that verbal and information skills may even continue to increase in later life….Furthermore, mental ability is not unitary; it has many aspects, which develop at different rates. Some may decline in later life while others improve; for each individual the process is a little different. (p. 18)

Longitudinal research on intellectual functioning as one ages "…presents a fairly positive picture of the continued learning potential of the adult throughout most of the life span…" stated Willis (1985), "…older adults have a substantial learning potential and [the literature] presents evidence of a special need for continuing educational opportunities in later life" (p. 843).

Perhaps the area of intellectual ability that has been the most re-searched and studied is that of "reaction time". For a variety of reasons, a person's response to physical and mental stimuli slows down as he or she ages. It takes older people longer to perceive, think, understand, learn and react than it does younger persons. Research has demonstrated that there is a direct linear relationship between increasing age and the reduc-tion in speed of response to a physical or mental stimulus. The slowed re-action time may be a consequence of a general decline in visual, hearing,

or tactile sensory abilities. It may also be a result of other physiological or health related factors or due to reductions in certain aspects of fluid intelligence. Both the body and the mind seem to get less efficient with regard to speed of response as one ages (McDonald, 1995). As with all aspects of the aging process, how severe and debilitating is the reduction in a person's response time is a function of individual genetics, health, experience, and conditioning. However, it should be kept in mind that the reduction in response time experienced as a function of aging does not necessarily equate to corresponding reduction in intellectual capacity.

In addition to reduced response time, other factors have been identified that impact mental functioning and learning in many older adults. Some of these are: *interference*, which may be the result of a conflict between former, well ingrained knowledge or beliefs and the new knowledge or experience, or conflict resulting from trying to learn two or more things at the same time, or increased susceptibility to environmental distractions; the *pacing of instruction and learning* where mental tasks must be completed under the pressure of time; problems with *organizing new information*, especially if it does not nicely fit into previously learned categories; a *lack of stamina*, where if a task takes too long older persons may not have sufficient energy to see it through to completion; and *motivational factors*, where much more so than with younger people, older persons need to have a pragmatic reason for learning something new and need to understand the relevance of what is to be learned to their personal life (Peterson, 1983; Lowy & O'Conner, 1986; Kausler, 1996; Peddie, 1994; McDon-

ald, 1995). All things considered, Lowy and O'Conner (1986) concluded:

> There is ample evidence that older adults can indeed learn and often at
> much the same level as their younger counterparts when environmental
> and situational factors have been better equalized. Minimizing the factors
> which may interfere with learning has come to be seen as a major task of
> educators of older adults. (p. 63)

5.4 Ways in Which Schools Involve Older Adults

Educating older adults in public schools is an idea that is very compatible
and harmonious with the concept of *community education*. Community educa-
tion is an educational philosophy, with the neighborhood school at its center-
piece, which promotes life-long learning as well as the participation and in-
volvement of all members of a school's community in the processes and out-
comes of education. Community education programs attempt to match the
learning needs of community residents with all resources available in the
community. It is a school reform effort that shifts the perspective from that of
a "school system" to one of an "educational system", changing the role of the
local school from one of the dispenser of knowledge for just the youth of a
community to one of providing educational opportunities for all members of the
community. The neighborhood school is considered to be the best mechanism
for developing and implementing the concept of community education. (Decker
 & Romney, 1992; Minzey & LeTarte, 1994).

In their review of the historical development of community education, Min-

zey and LeTarte (1994) have identified four principles or beliefs that most of to-day's community education programs seem to have in common. These are:

1. The schools serve all of the community, not just its youth. As the educational center of the community rather than the educational center for the youth of the community, *the school should provide all people extended learning opportunities* (italics added).

2. The school facilities in a community are a major resource of that community, and *maximum use should be made of that resource* (italics added). Schools should not be limited to an 8:30 to 3:30 p.m. day, and should be available in the evenings and on weekends for a variety of community activities.

3. Educational opportunities made available to the community *should reflect citizens' interests and needs* (italics added).

4. The quality of the education provided the children is enhanced when a close relationship between the school and the community is established. (p. 30)

Implicit in these principles is the concept that schools should play a significant role in providing educational services to adults in a community, of which a significant and growing proportion are senior citizens. If our society truly believes in the importance of life-long learning, then it would seem appropriate that the local public school, in affiliation with other educationally related organizations, should play a major role in this process. The needs of the adult student, including the elderly "…would be recognized as being as important as

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those of the school-age student, and the students would be perceived as all of the people who reside in that community" (Minzey & LeTarte, 1994, p. 84).

With the significant demographic changes that are looming on the horizon, schools will be under increasing pressure to expand their instructional offerings and other services to meet the emerging needs of an aging population. Historically, those schools that have established community education programs and that have made an effort to involve older persons in their facility, programs and services, have done so in two primary ways. First, older adults, senior neighbors, and grandparents of students have been viewed as a readily available pool of volunteers able to assist teachers by tutoring and mentoring children, or by helping out with necessary but relatively menial tasks such as duplicating papers or producing certain instructional materials. Secondly, some schools offer in-house programs designed to benefit seniors themselves in a variety of educational and social welfare ways, such as by providing hot meals, space for club meetings, hosting a senior center, or sponsoring special programs that are recreational or health related (Figure 12).

While these are worthwhile and important programs and services, it is apparent that having both the ability and the opportunity to learn throughout one's lifetime is critical to remaining a mentally alert, knowledgeable, and active participant in a rapidly changing, technologically oriented and information-based society. "There is no doubt that matters of adult development and aging must be high on the agenda of educational institutions for the decades ahead if we are to realize fully the human resources potential of America" (Birren, in

Peterson, Thornton & Birren, 1987, p. iv). Public school educators must
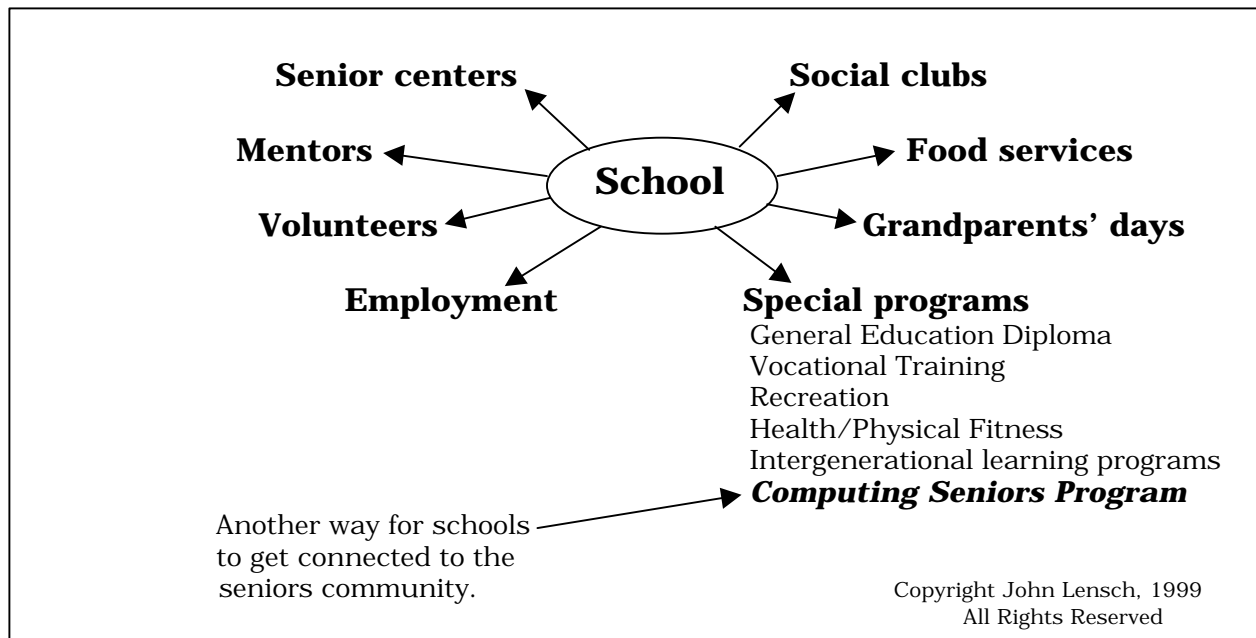
Figure 12. **How some schools have connected with older persons.**

understand that they have an important role to play in this regard and should

work towards its realization. "The school can no longer be content to be a place

that takes care of juveniles not old enough to work," proclaimed Drucker, "It

will increasingly be the partner of adults as well as the partner of their em-

ploying organizations" (1995, p.260).

5.5 The Need for Life-long Learning in a Changing Society

Many older persons grew up during, were educated in, and spent most of

their working lives in the industrial era when it was not critical to their per-

sonal success to be technologically literate. Even during the last ten to fifteen

years, when computers began entering the workplace in large numbers, many people could effectively avoid learning the new skills and still get by, especially if they were close to retirement. In the early 80s, few people over the age of 50 probably realized how all pervasive the personal computer would become and the critical role it would play in the economic, social, educational, and all other institutions of our society.

The changes that have and are continuing to occur in American society have happened at such a rapid pace that many older people have been effectively left out of the information and technological revolution. It is apparent that Americans are living longer, but for many of them who lack the basic knowledge and skills necessary to successfully participate in the affairs of modern society, will their lives be any better? If seniors are to be active participants in and contributing members of the knowledge society, it is imperative that they be provided with educational opportunities designed to meet their unique learning needs, ones that will enable them to learn computer and other important Information Age skills. According to Galbraith (1995):

> Lifelong education is education for a changing world…individuals of all ages must extend their cognitive, affective, and motivational domains to cope with the changing intellectual demands of society. The ability to understand the social and technological aspects of their culture as well as the ability to understand themselves is vital. (p. 7)

If schools and other organizations concerned about the well-being of older Americans do not provide seniors with the knowledge and skills needed to cope

with life in an age of rapidly expanding knowledge and changing technology, our nation may inadvertently create what Conner (1992) called "an age-based underclass" (p. 30), a very large and potentially influential group of citizens that will not have the knowledge and skills needed to access, relate to, understand, work in or otherwise benefit from the fast paced, rapidly changing, high-tech world of the Twenty-first Century. Having such knowledge and skill will not guarantee success in the post industrial era, but not having it is sure to put anyone, and especially seniors, at a significant disadvantage.

Drucker (1995) raised the specter of a potential "class conflict" between those who have the keys to the knowledge society and all of its benefits, and those who do not. Knowledge in the age of information has become the key resource for both individual and national success in a rapidly changing global economy. For this reason alone, Drucker suggested that "…learning can no longer stop at any age….The school can no longer be content to be a place that takes care of juveniles not old enough to work. It will increasingly be the partner of adults…" (p. 260).

At one time, the knowledge, experience, and wisdom gained from a lifetime of work and living gave the senior members of a community a respected and even revered status in many societies, including our own. The opinions of the elders were frequently sought out and relied upon to help guide and lead their communities and cultures, especially in times of difficulty. Today however, the highly mobile and transient nature of our modern society, combined with the temporal nature of knowledge, work, and many life skills has reduced the rela-

tive value to the society of that knowledge and those abilities which are gained from life-long experience. "The role and status of the aged varies systematically with the degree of modernization of society and that modernization tends to decrease the relative status of the aged and to undermine their security within the social system," stated Cowgill (1972, p. 13). Cowgill calls this phenomenon in the evolution of a culture—as its knowledge, tools, means of production, and living conditions become more sophisticated—*modernization theory*. He suggests that the rapid modernization of our society over the last century, combined with the Puritan work ethic that is so highly valued and prevalent in Western societies, have resulted in a devaluation of those persons not perceived by the culture as being productive and contributing members of society.

The development of retirement, pensions, and the establishment of health and social welfare safety nets for older people were direct consequences of modernization according to Conner (1992) and Cowgill (1972). As the knowledge and tools of the workplace became more complex and sophisticated, in typical gesellshaft fashion, older and usually less well educated people needed to be "gotten out of the way" to make room for more highly trained and better prepared younger people in the work place. As Conner, (1992) worded it:

> In a society that places a high value on the work ethic, the loss of
> productive employment leads to a redefinition of the individual as no
> longer useful or important....Older workers whose skills and abilities are
> no longer in demand remain locked in careers and occupations
> characterized as obsolete. (p. 33)

The situation is further complicated by the explosion in the rate of knowl-edge creation and its universal accessibility, which reduce the long-term value of knowledge and wisdom gained through experience and a long life. The fast-paced, temporal nature of the knowledge and products of modern society, com-bined with high speed global communications, puts those who can not keep up at a significant disadvantage (Cowgill, 1972; Moody, 1987).

The economically and technologically driven societal perspective of obsoles-cence and the subsequent devaluation of older people spills over from the world of work into the general culture, alienating seniors from the main stream of ac-tivity, influence, and concern. But, as has been previously established, with the projected reduction in the number of available younger workers, the vast size of the aging population, and the significant economic and political influ-ence older persons are likely to have in the not too distant future, our society can ill afford to ignore such a large and powerful segment of the population. Education, whether obtained through one's personal study and effort or through more formal programs provided by public schools, colleges and univer-sities, employers, and other organizations is the key to unlocking the potential benefits that older persons can obtain for themselves as well as those which they might contribute to the broader society.

An argument has been made that public schools must begin recognizing these changing demographics and educational needs of our nation, and that educators should begin expanding their vision of who is the public that must be served to include nonparents and older adults. One program that has re-

ceived national attention (Lensch, 1997; Ryan, 1997) is the *Computing Seniors Program*, a community-based educational program conducted in public schools that was created specifically with the learning needs and characteristics of older persons in mind, with the goal of empowering them with the knowledge and skills necessary to begin their journey into the age of information, computers and technology.

What follows is the story of the Computing Seniors Program from its inception and implementation at one elementary school to its expansion into a program that may eventually have an impact on many other schools and communities. The reader is reminded that, as was stated in the methodology section and introduction to this chapter, the case of the Computing Seniors Program is being studied and analyzed to determine if it contains any elements of the process of change as identified and described by the Change Delineator Theory in order to begin the process of theory validation.

6. COMMUNITY EDUCATION FOR THE INFORMATION AGE: THE COMPUTING SENIORS PROGRAM

6.1 Historical Background and General Description of the Computing Seniors Program

The Computing Seniors Program was a concept originated in the late autumn of 1995 by the researcher, who was at the time the principal of Highland Park Learning Center, an elementary-level magnet school in Roanoke, Virginia. The school is located in a section of the city that is locally known as "Old Southwest," a neighborhood that, while designated as an historic district due to the age and architectural significance of many of the homes, also contains many low income apartments and run-down housing. After working eight years in the school, the researcher has come to know the neighborhood as being made up of a somewhat mobile and heterogeneous blend of persons ranging from the very poor to the very affluent, persons from many different racial groups, and a significant number of older persons who have spent virtually their entire lives in the area. In response to the city's efforts to revitalize this section of the city, including a three million dollar renovation of Highland Park elementary school in 1989, which resulted in its conversion into a state-of-the-art technology magnet school, many young, upwardly mobile professional families have begun to move into the area as well.

Due to the transient nature of many of the neighborhood's residents, the changing demographics of the area, the diversity of the neighborhood residents, and the fact that as a magnet school many of the students are drawn from

neighborhoods throughout the city and from other districts across the Roanoke Valley, it has been difficult for the school to establish and maintain a sense of ownership and community among the school's children, families, and neighbors. As a long-time advocate of community education, the researcher was looking for ways of obtaining greater parent and citizen involvement in the school in an attempt to reestablish a sense of community, ownership, responsibility, and support for what goes on in the school. Toward this end, several efforts had been undertaken in an attempt to get the community more involved in the school such as hosting "fun nights" and "game days", establishing business partnerships with an architectural company and a church located in the neighborhood, and promoting greater volunteer participation in the school. While such efforts were worthwhile, the search for ways of obtaining still greater community involvement in the school continued.

Highland Park Learning Center is a "high-tech" school, with over one hundred networked computers and other instructional technologies available in classrooms throughout the building. A computer lab located in the school's library contains 20 state-of-the-art multimedia Macintosh computers, a teacher's presentation computer with video projection, and access to the Internet. During the normal school day this equipment is in constant use by children from preschool through the fifth grade for a wide variety of activities ranging from instruction in basic computer literacy and operations to student learning and productivity in writing, research, problem-solving, and reinforce-

ment of basic skills in the traditional content areas. At the end of the school day, from about 3:00 on, this expensive array of equipment is idle.

While driving home from work one day in the fall of 1995, I happened to hear a radio commentary about how many senior citizens felt left behind by the technological revolution and the Information Age. According to the commentator many of them had retired before personal computers were common in the workplace, and such computers did not exist when many of those seniors were of school age. The computers that were in use during their youth or working years were typically the large and expensive mainframes which were programmed and operated by a relatively few highly trained and skilled technicians and programmers. As I listened to the story, I thought about the possibility of opening the school's computer lab to senior neighbors and grandparents of the children of the school to provide them with an opportunity to learn about personal computers and related technologies, much as we do for our younger students. By bringing them back into the school for an educational program that was designed to meet their needs, I thought the seniors would also get to see and learn more about what goes on in public schools today and how their tax dollars were being spent. It was hoped that this experience would renew their faith in and support for public education, and for our school in particular. Thus was born the idea for the Computing Seniors Program.

In November of 1995, a description of the Computing Seniors concept was written and submitted in application for an administrative mini grant to obtain the funds needed to conduct the program. The original goal of the program as

stated in the grant application was: "To enhance the school's learning environment by increasing the level of community involvement and support for the school and its programs" (Lensch, 1995, p.1). I believed that if we were able to make the school's facility and equipment accessible to the general public, especially to seniors who are a segment of our community that is not typically involved in nor overly concerned with public education, that we could increase support for and improve the relationship between the school and the general community. In addition the program would provide important educational and other benefits to older persons who would participate in the program.

After review by the central office, a mini-grant of $840.00 was awarded to the school to establish the initial budget for the Computing Seniors Program (F. Pleasants, letter to J. Lensch, November 30, 1995), with the bulk of the money allocated to the instructor's stipend and a small amount of consumable computer supplies and other program materials (actually, only about $500.00 was spent in conducting the first course).

An experienced, computer literate retired individual, late sixties in age, whom I'll call Jim, was hired to be the program's initial instructor. Jim and I met several times to outline the goals and objectives of the program and to design the initial curriculum guide. As Jim was only familiar with MS-DOS and Windows-based computers, it was also necessary to teach him how to operate Macintosh computers and software, which he quickly learned. Jim was purposely hired to be the first instructor and to assist with the program design as I believed that a person of his age would be more likely to have greater knowl-

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edge of and sensitivity to the physical, social, and learning needs of older adults than might those of us whose own age, educational backgrounds, and job experiences were more attuned to the needs of younger generations and elementary students.

While the Computing Seniors curriculum and program design was being developed, a short article describing the program was placed in the school's monthly newsletter, and a one-page flier to advertise its availability was sent home with the children and distributed to churches, shops, and recreation centers in the school's neighborhood. Not knowing what to expect, we were hoping to get 10 to 12 people to enroll in the first course. We not only filled the twenty available seats for the first class, but ended up with a small waiting list. Jim, with me serving as his instructional assistant and equipment troubleshooter for the first few sessions, began conducting the classes in mid-January of 1996 and continued to do so for the following twelve weeks. The first course ended in early April.

6.2 Expansion of Computing Seniors to Other Schools

About midway through the first Computing Seniors course, the education features reporter from the local newspaper was invited to come to the school to observe the seniors in action and to obtain information for a possible human interest story about the program. After the article entitled "Seniors: Its Never Too Late to Learn" (Turner, 1996a) was published in mid-March, the school's phone and those in the district's technology office began ringing, with seniors

from throughout the Roanoke Valley wanting to find out how they could get enrolled in the program. We soon had a waiting list that had grown to about 80 persons for the next course, which we hoped would begin in October of the following school year. About a week after the article ran, the local newspaper published a complimentary editorial extolling the merits of the Computing Seniors Program:

> Its not just about computers….It's also about recreating a sense of community in neighborhoods, and bridging the generation gaps. What better way than to open the public schools in the evening and on weekends for multipurpose use by all of a community's residents? ….It would be nice if more such ideas, like Highland Park Learning Center's, were implemented. (Editors, 1996, p. A4)

After such positive publicity for the school, the superintendent came over to Highland Park to observe the seniors and to learn about the program firsthand. The excitement and appreciation of the seniors for the program was very evident. Many thanked him for allowing such a program to occur in the school and strongly encouraged him to not only continue it but to expand the project to other neighborhood schools.

At the next monthly principals' meeting, the superintendent told the principals and administrators present about what he had seen at Highland Park and described the energy that was present among the older adults of the community he had met. He told those present that this was the kind of community involvement program we needed, and that it was a good way of obtaining sup-

port for the schools from the non-parent community, especially since approximately 70 percent of the households in Roanoke City do not have children in our schools. The superintendent encouraged principals to consider beginning the Computing Senior Program in their respective schools. To back up his support for the program he added that he would fund the project for up to $10,00.00 to cover the cost of salaries and related expenses. Three additional schools, two elementary and one high school, decided to get involved for the following year.

In September of 1996, Roanoke City Schools Department of Technology staff hosted a meeting with the principals and prospective instructors from the three schools that had agreed to adopt the program, along with those from Highland Park, to discuss the curriculum and program format developed and implemented at Highland and also to share with them what we had learned about conducting an educational program for older persons in a public school setting. With the addition of these schools, four sites were now available, offering classes in the fall and spring semesters. By the end of the 1996-97 school year approximately 300 seniors had participated in the courses offered at the four sites.

During the 96-97 school year two Roanoke City schools received positive publicity in an article appearing in the Roanoke Times that, in addition to telling the public about Computing Seniors, emphasized a unique innovation in the program. Students from a nearby high school (one that was not hosting a Computing Seniors Program at the time) were volunteering as instructional as-

sistants in a Computing Seniors Program conducted at a near-by elementary school to fulfill a community service requirement for their diplomas. This added an intergenerational aspect to the program that had not here-to-fore existed (Turner, 1996b).

In addition to the local newspaper articles, publicity also appeared in several issues of the school division's general newsletter called *New Horizons* (Roanoke City Schools 1996, 1997a) as well as the division's magnet schools newsletter entitled *Attractions* (Roanoke City Schools, 1997b). These publications are sent to all school employees, parents of children enrolled in the school system, local government officials, and other persons interested in the affairs of the school division.

National attention was drawn to the program when articles about Computing Seniors were published in *Educational Leadership* (Lensch, 1997) and *Parade* (Ryan, 1997) magazines. As a result of positive publicity obtained during the program's second year, and with the continued support and encouragement of the superintendent, an additional thirteen Roanoke City schools decided to offer a Computing Seniors Program for the following (1997-98) school year. The Director of Technology for Roanoke City Schools estimated that by the end of the spring semester of 1998, approximately 600 seniors had participated in beginning and intermediate-level programs conducted at the 17 schools in Roanoke City. The budget to conduct the program had grown from its original $500 expense at Highland Park, to approximately $18,000 in the fall of 1999. A nominal $10 fee was added to help defray the cost of paper,

materials, supplies, and refreshments (Baker, 1998).

6.3 Description of the Computing Seniors Curriculum and Program

The Computing Seniors Program was designed to meet the learning needs of older adults who had little or no experience with personal computers and related technologies. Any school that has a computer lab that contains a dozen or more terminals could offer a Computing Seniors Program. Other organizations such as a public library, recreation program, government agency, or private business that have access to a computer lab, the staff, and time available for conducting a two hour class once or twice a week could also conduct the program.

The course begins with an explanation of basic of concepts and terminology including the identification of the components of a computer system. By design, the instructors avoid getting into anything that is jargonish or "techie," as one of the basic premises of the program is that most novice computer users do not need to know what is going on inside the box, much as a driver doesn't need to know how a transmission works in order to effectively drive a car. A typical course consists of ten to twelve, two-hour sessions, offered once or twice a week. Classes are held after the regular school day has ended so as not to interfere with a school's normal instructional programs and services. Refreshments and opportunities for participants to socialize are also usually offered (Roanoke City Public Schools, n.d.).

The original curriculum plan for the Computing Seniors course as it was

conceived at Highland Park has been slightly modified and added to by a number of instructors and by the staff of Roanoke City Schools Department of Technology. In its present format, it consists of the following sessions and content:

Session 1: Introduction to the computer; some parts, basic terminology, how to turn it on/off; basic functions, mouse practice.

Session 2: Review of first lesson; more mouse practice; manipulating basic screen functions, menu bars, brief introduction to word processing.

Sessions 3 – 5: More practice with basic screen commands and word processing; typing and correcting paragraphs or letters.

Session 6: Editing and printing functions; introduction to and practice with drawing tools.

Session 7:   Make and print a greeting card.

Session 8: Introduction to CD ROMs and multimedia; launch and use a program on CD; more practice with skills learned in sessions 1-6.

Session 9: Loading other programs, files and games; saving data to disks and hard drive; explore a few different educational programs.

Session 10: Review and practice session – seniors' choice.

Session 11: Introduction to the Internet; modems and how to use them; surfing the net.

Session 12: More practice surfing the net; practice other skills (senior's choice), graduation program and potluck supper (Roanoke City

Public Schools, 1997b).

The nature of the content and how much is covered in a session is very dependent on the average age and ability of the senior participants. The staff at each site has the latitude to vary the curriculum and program in accordance with what they perceive to be the needs and abilities of their participants. Much like instructional programs conducted for younger persons, the pace of the classes is highly dependent on variables such as the number of students participating, their age range, their physical and mental abilities, the level of prior knowledge and experience they have with typewriters and computers, and how many instructors and assistants are available. One thing common to all programs, was that it takes more than one person (at least one instructor and one or more assistants) to accommodate age-related differences among senior participants in their physical, auditory, visual, and intellectual capacities. Some seniors were quite capable, had a good degree of self-confidence, and picked up computer skills quickly, while others required a great deal of personal attention and patience from the instructing staff in order to make any progress.

6.4 Expansion into a Program with a National Scope

As a result of the *Parade* (Ryan, 1997) and *Educational Leadership* (Lensch, 1997) articles, which appeared in 1997, calls were received from people across the nation who were interested in sponsoring or participating in Computing Seniors in their localities. "The city even received calls from schools as far

away as California and Florida interested in starting their own classes"
(Roanoke City Public Schools, 1997a). Calls were also received from persons at
community colleges, libraries, and recreation centers wanting more informa-
tion. Additional national attention was drawn to the program when in the
spring of 1998 Roanoke City Schools received an honorable mention for Com-
puting Seniors in the *American School Board Journal's* annual Magna Awards
recognition program (Editors, 1998).

A couple of weeks after the *Parade* magazine article was published, I re-
ceived a phone call from a Mr. Michael Kelly, President of Technology Learning
Systems, Inc. (TLS) of Dublin, California. TLS is the parent company of a new
publication entitled *Digital Age*, a combination lifestyles and technology ori-
ented magazine aimed at persons 50 years and older. "Digital Age…will include
jargon-free articles that explain how computers can augment the needs and
lifestyles of senior citizens" (Romjue, 1997, p. E1). As the vision, design, and
intent for *Digital Age* by its publishers was very similar to the philosophy and
practice of the Computing Seniors Program, Mr. Kelly wanted to meet with me
to discuss how his organization might help make Computing Seniors available
across the nation.

We met in the late spring of 1997 to discuss our mutual interest in pro-
moting computer literacy among senior citizens. After a number of phone calls,
e-mails, and written correspondences we agreed to work together to attempt to
take Computing Seniors national. TLS Media established the Digital Age
Foundation, a private, nonprofit 501-3C organization, which would donate

resources to and help manage the Computing Seniors Program on a national scale. Funds supplied by the foundation are used to promote Computing Seniors and to provide any school or other appropriate group or organization with the necessary start-up materials, including a curriculum and "how to do it" guide, tee shirts, and mouse pads with the Computing Seniors logo, all at no cost to the sponsoring school or organization. A recent press release is indicative of their support:

> What sets Computing Seniors apart from other programs is that it requires very little administration at all. The Digital Age Foundation is recruiting industry sponsors to help supply the necessary materials, but this is really a program put on by the local school districts. The school districts love to get involved because it really gives them a way to get the surrounding community involved in the educational process, an issue they face every day. (Opperman, 1997, p. 1)

With the continued backing of the Digital Age Foundation, Computing Seniors may spread more rapidly across the nation than it might otherwise have done.

Wherever a Computing Seniors Program may be located, it will continue to promote the active participation of older persons in the affairs and activities of their neighborhood school. It has brought and continues to bring different generations together—some who are quite far apart in years, experience, and technological expertise—around the mutual need and interest of becoming a participating member of the electronic/computer age.

6.5 Why School Leaders Should Consider Sponsoring
a Computing Seniors Program

At this point, a school leader might be asking the following question: O.K.— so the nation's population is growing older, a lot older—and older people probably have been left out of the computer revolution for the most part. But what does this have to do with providing services to seniors in public schools when our primary mission is to educate the youth of today, and especially since we can barely get enough financial support to adequately carry out our primary purposes? How can we justify to our school boards, other funding sources, and local government officials that we would like to, or as you suggest, need to provide educational services to the elderly in our public schools? Why should we invest our time, energy, and other resources in such services? These are valid and important questions that should be discussed and debated. The following points attempt to answer some of these concerns.

Today, our sense of community, like so many other human relationships and experiences, is a more temporary phenomena for many people than it has been in years past. If most communities are no longer the stable, dependable, mutual support systems they used to be, and if, as many sociologist and psychologists suggest, belonging to such a support system is an important aspect of our human nature, then somehow our society must develop methods for reconnecting people to each other and to the services they might need. In this temporal world of rapid change, we must evolve "new communities" that have the flexibility and adaptability to accommodate the needs of people living and

working in today's fast-paced world. The combined power of telecommunications, television, and computer technologies may very well become the "town commons" for communities of the Twenty-first Century. These media could produce a "virtual community" not limited by the constraints of time, space, geographic location, or other factors. However, there is at least one caveat to being a participating member of this new community—a person must have the knowledge, skills, and access to the equipment needed to access and be able to communicate with others in the new community. All people, regardless of age, sex, race, or economic status, in order to become a member of this virtual community, will have to be technologically empowered. They will have to have mastery and control over those aspects of the Information Age that directly impact their lives.

Historically, it has been a major function of our country's public schools to provide citizens with the knowledge and skills they need to be successful and participating members of our democratic society and Free Enterprise economic system. Many people consider a free public education to be a basic right for all persons, regardless of their nationality, race, creed, disability, *or age* (Lowery & O'Conner, 1986). An educational program such as Computing Seniors provides older persons with an introductory level of technological knowledge and skills needed to enhance their work-related qualifications, thus possibly extending their productivity and employability for a longer period of time.

Many older persons want or need to work beyond the traditional retirement ages of 62 or 65, which, if they choose to do so, increases their economic inde-

pendence and their standard of living while reducing the potential tax, social security, and social-welfare burden they might otherwise place on younger workers. In addition, many older workers bring a wealth of prior knowledge and experience, as well as a strong work ethic, to their place of employment. According to Lowery & O'Conner (1986):

> Older adults are a largely untapped source of human potential which can make significant contributions to the productivity of the nation….Studies comparing older and younger workers have revealed that older adults are often more dependable, have lower absentee rates and fewer accidents on the job than younger workers. Age is simply not a good predictor of productive capacity. (p. 165)

Data collected from participants in the Computing Seniors Program indicate that about 10 percent of the respondees were still working a full-time job and needed computer skills to maintain their productivity, or they were hoping to find part-time employment for which they needed basic computer knowledge and skills. Not only do many seniors need computer skills to continue working in their present positions or to find new employment, many potential employers actively seek out technologically capable seniors. For example, Roanoke City Schools received a letter from a local company that recruits and hires computer literate retired persons to work part time in their telemarketing operation. The letter requested that instructors of the Computing Seniors classes announce to participants the company's desire to hire computer literate seniors (N. DeBusk, personal communication, August 19, 1997). Referring to technology and other

forms of skills training needs of seniors, Morris (1994) stated:

> Given the expected increase in the population of older adults in the United
>
> States, and the likelihood that many members of the older population will
>
> seek employment, these needs must be addressed so that society is
>
> equipped to meet the changes that accompany aging. (p. 553)

The Computing Seniors Program and other educational programs for older
adults provide educational opportunities that enable those who take advantage
of them to have potentially richer, fuller, more meaningful, and more active
lives. People who remain physically and mentally active in their later years are
more likely to have fewer physical and mental impairments than their more se-
date cohorts (Fillit & Butler, 1997). Such persons remain more active in the
affairs of their communities; are better decision-makers on political, health,
and consumer matters; have a greater sense of self-worth, efficacy, and self-
esteem; and maintain their independence longer than those who are less ac-
tive (Lowery & O'Conner, 1986; Manheimer et al. 1995; Peterson et al. 1987).

Today, perhaps more so than ever before, knowledge is power. Education
and the knowledge it imparts empowers persons of any age. In today's rapidly
changing world, knowing how to use computers and related technologies is a
key to accessing many of the benefits of modern society, and also to avoiding
many of the potential pitfalls. "Education must shift from an orientation to-
ward the past to one toward the future where the *process of knowing* is more
important than the static notion of knowledge" (Peterson et al. 1987, p. 17).

The Computing Seniors Program enables and empowers older citizens of a

school's neighborhood community to become active and participating members of its learning community and important, supporting participants in its future. "…Only when the education of older people is linked with the solution of problems for other age groups," concluded Manheimer et al. (1995), "…will communities and the education hierarchy willingly provide resources for their education" (p. 128). Those educational leaders who have established Computing Seniors Programs in their schools seem to recognize the importance of this linkage and are working to establish a positive, mutually supportive relationship between their schools and the seniors in their community.

7. COLLECTION, PRESENTATION, AND ANALYSIS OF THE DATA

With the advent of the 1998-99 school year, the Computing Seniors Program entered its third year of operation in Roanoke City Schools. Much has been learned and some changes have been made at the different sites since the program's inception. To tell the story of the program and to determine how it has grown and evolved for the purpose of ascertaining if any of the factors described by the Change Delineator Theory are present in this case, a variety of data sources were utilized including personal interviews, questionnaires, and assorted documents.

7.1 Questionnaire Development

Questionnaires were developed to obtain data about the Computing Seniors Program from principals, instructors, senior students, and Roanoke City Schools' superintendent (see Appendices D, E, F, and G). Questions were designed to elicit information from all respondees in six conceptual categories consisting of: contextual and historical perspectives; motivational factors; prior knowledge about learning in later life; program format regarding the learning needs of seniors; program impact, costs, and benefits; and, information about the processes of innovation and change.

Prior to conducting the interviews and collecting the questionnaire data, the questions asked to the principals, instructors, and seniors were reviewed by seven independent readers, who compared the interview questions to the research questions to obtain their objective opinions as to whether or not they

thought the questionnaires would produce data pertinent to the conceptual categories. Those questions that a majority of readers agreed would probably ellicit the desired information were kept, while those that the readers did not seem to think would obtain the desired information were modified or discarded. The readers' responses are listed in the questionnaire validation tables that follow the respective questionnaires contained in Appendices D.1, E.1, F.1, and G.1.

7.2 Populations and Samples

Sixty-five people provided information for case study through a combination of interviews and questionnaires. The researcher conducted personal interviews with eight principals of sponsoring schools (six elementary, one middle and one high school), twelve instructors in the program, and the superintendent of Roanoke City Schools. A total of nine of the seventeen Computing Seniors sites operating in the Roanoke, Virginia, area at the time of the study were represented, three early adopting schools and five later adopting schools, as well as personnel and senior students at Highland Park, the initiating school. Eight schools were from within the Roanoke City system, and one was from another school division in a nearby county. Data collection was halted when redundant information began to be generated.

Utilizing both mailed questionnaires and personal interviews, forty-four senior students who had participated in one or more Computing Seniors courses at the nine sites represented in the study provided information on their perspectives of the program. This data was obtained from 37 of 60 seniors (62

percent return rate) who completed the questionnaires and from interviews during site visits with seven randomly selected individuals who were asked the same questions as were listed on the mailed questionnaires. There were no specific criteria for selecting seniors who would receive the questionnaire. Instructors or principals provided their current class lists of participants in their respective Computing Seniors Programs at the time of the data collection component of the study, and each one was sent a questionnaire accompanied by an explanatory cover letter. The average age of the forty-four seniors who participated in the study was 71 years, and females outnumbered males by a three-to-one ratio.

7.3 Documents

In addition to obtaining data through the use of interviews and question-naires, a variety of other sources were used to obtain information about the Computing Seniors Program from its inception and implementation at one school through its expansion to eight other schools. The array of documents reviewed included personal notes and correspondences of the researcher, newsletters, promotional materials, curriculum materials, and published articles (see Appendix C for bibliographic details of specific documents).

7.4 Method of Analysis

Data from the aforementioned sources was collected and organized utilizing the constant comparative method of data analysis originated by Glaser and

Strauss (1967) as modified and described by Maykut and Morehouse (1994). Responses to questions asked in the interviewing process of the principals, instructors, and the superintendent were transcribed verbatim and were recorded under each question's conceptual category. Each person's transcript was then cut into six sections, one for each of the corresponding six conceptual categories. These sections were subsequently placed in six conceptual category folders. The resulting folders contained the respective responses of the principals, teachers, and the superintendent to the same domains of inquiry. Similar or related statements indicating consistent and underlying patterns, trends, or themes within each of the six conceptual categories were highlighted.

In a similar manner, data obtained from documents that were relevant to the any of the conceptual categories was also highlighted and placed in its corresponding conceptual category file. Unlike the questionnaire and interview data, not all documents contained information that was pertinent to each of the six conceptual categories. The similar and related statements from the questionnaires, interviews, and documents under each conceptual category were summarized and are listed verbatim in Appendix I. These statements were then reviewed and analyzed to determine if they contained any new insights or if any of the basic concepts suggested by the Change Delineator Theory were present in the data. According to Leik (1972) and Merriam (1988), it is the underlying patterns, if any, that help to make sense out of a phenomenon, i.e. change, and that lead to theory development.

8. FINDINGS

8.1 The Computing Seniors Experience as it Relates
to Educating Older Persons in a Public School Setting

Data obtained from the interviews and questionnaires indicated that there were certain patterns in the delivery of instruction to the seniors in the setting of the public schools studied in this case. At the time the study was conducted, some 300 to 360 seniors, with an average age of about 71 years, had participated in the Computing Seniors classes offered at the nine sites involved in the study. Female seniors who responded to surveys outnumbered their male counterparts by a ratio of 3:1, which is consistent with the researcher's observations of class enrollments in his school over the past three years.

Six of the eight principals interviewed, eight out of the twelve instructors from whom data were obtained, and the superintendent, indicated that prior to their involvement in the Computing Seniors Program they had little formal knowledge about the process of aging or the needs of the elderly in general, let alone what their needs might be in an educational setting. The majority of the responders to the questions concerning their prior knowledge of the learning needs of seniors indicated that most of the knowledge they had in this regard came from family experiences—those they obtained by taking care of aging parents or other relatives. Principals' responses tended to be more generalized to the elderly population as a whole. Only two principals mentioned specific conditions they had observed in the senior students, while eight of the twelve instructors referenced specific physical or mental conditions they had to deal

with in the process of delivering the instructional program to the seniors. This is most likely a result of the instructors having had direct contact with older students in the process of conducting the classes, while the principals had little, if any, direct contact in an instructional setting.

Each of the twelve instructors spoke of the great range in abilities and physical conditions of the senior students they had come to know. They identified poor sight, hearing problems, difficulty with eye-hand motor coordination, and arthritis as the most common physiological factors they had to take into consideration when planning for and working with the seniors. Difficulty with mastering the manipulation of the mouse and synchronizing its movement to the action of the screen pointer to activate certain computer functions was mentioned several times as being particularly hard for many seniors. It was also stated by several persons that while the seniors were apparently more cautious and deliberate, they seemed to be as capable of learning to operate computers as are younger persons, although at a slower rate. Similar conclusions were drawn by researchers in the field of aging and learning such as Hartley, Hartley, and Johnson, 1984; Morris, 1994; and Zandri and Charness, 1989. In general, the mental, physical, and social conditions of the senior students as described by the instructional staff from the nine sites were quite similar to those identified in the literature concerning factors that affect learning in old age as discussed in sections 5.2 and 5.3.

All of the instructors saw similarities between their work with the seniors and their experience in teaching younger students. Not surprisingly, differ-

ences in learning styles observed by teachers among children apparently are still present in later life. The instructors stated that they tried to approach these differences in much the same way they do with their younger students, by providing a variety of hands-on learning activities, modifying instruction to better meet individual learning needs, and providing sufficient drill and practice. Differences in learning styles among older learners is a consideration also identified in the literature of educational gerontology (McDonald, 1995; Morris, 1994; and Peterson et al., 1987). Whether or not our learning styles remain basically the same as when we were children or whether they change as we age would be an interesting area to study. It is apparent though that there are differences in learning styles between people at all ages.

The teachers found that while the seniors were eager learners and often did not want to quit working on the computers, many were more easily frustrated (or at least they communicated their frustration more openly) than were the teachers' younger students. Several instructors mentioned that they had to give the seniors much more precise, step-by-step directions than they did younger students as many seniors were not willing to ask questions or to experiment with the equipment or the software. Children, according to several instructors, were much more willing to play and to experiment with the equipment and software to see what these things will do than were the seniors, who, it was felt, were overly concerned with getting tasks done in the proper order and done correctly. Instructors also felt that children were more willing to ask questions or to ask for help than were the seniors. This factor prompted sev-

eral instructors to make a concerted effort to check with the seniors more fre-

quently about their understanding of the material presented in the classes.

These observations on the part of the instructors are in harmony with what ge-

rontologists believe about fluid (abstract reasoning and perception of complex

relationships) and crystalline (long-term memory, repetition, cumulation of life

experiences) intelligences, and the relative strength of each as human beings

age (Lowy et al. 1986; Moody, 1987;

Glendenning et al. 1995; Peterson, 1983) (see section 5.3.1).

    Finally, the instructors mentioned a number of times that the senior

students were very appreciative of them and the sponsoring schools, much

more so than the teachers perceived their younger students to be. Perhaps this

is a factor related to the seniors' roles as voluntary students as opposed to the

involuntary status of children in most schools, and as is suggested by Morris

(1994), they are therefore "predisposed to having more positive attitudes" (p.

548) about their experiences in the Computing Seniors classes. Furthermore,

because the questionnaire data were generated by those seniors who voluntar-

ily participated in the program and were also motivated enough to respond to

the survey, they were more likely to have positive feelings and to express their

support for the schools than might otherwise be seniors in the general popula-

tion.

8.2 The Computing Seniors Experience as it Relates
to Improved School-Community Relations

The Computing Seniors Program was unanimously considered by principals, instructors, the superintendent, and the senior participants as having a very positive impact on school-community relations. Each of the eight principals interviewed and the superintendent stated that a big part of their motivation to get involved with or in supporting the Computing Seniors Program was their belief that the program would enhance the image of the schools and the school district in the eyes of the tax-paying public, and especially with non-parents, that segment of the community that is not directly served by the public schools. The superintendent's comments about why he supported the program are representative of the consensus:

It was a great idea. This is an excellent way to open up the schools to

the entire community...a way to say "Come in, this is your school"...a way

to get those individuals engaged....In this age, when everyone needs to

become technologically literate, we should be using every resource we have

to make sure every citizen in the community has an opportunity to learn

how to use technology.

There was also a strong belief on the part of the administrators and instructors that it was appropriate, practical, and efficient to use the school facilities and equipment after the regular school day for the benefit of the general public, a sentiment much in harmony with the philosophy and practice of the community education movement discussed in section 5.4. "It is a good way of

promoting the educational goals of the school system and to make the school accessible to people who don't have a stake in the educational community" reflected one principal during an interview with the researcher, "It's a chance to show that even if you don't have kids in school, school can do something for you directly...especially to taxpayers and retired people who would ordinarily have no real stake in public education".

Many of the seniors who provided information for this study also commented on how appreciative they were to the staff of individual schools and the school district in general for offering the Computing Seniors Program. Of the 45 seniors who provided data, 42 of them (93 percent) made very positive, supportive, and appreciate comments in this regard. Typical of the responses received from senior participants in the program are those of 72 year old Greg, who stated "I congratulate the Roanoke City Schools for the opportunity to help us senior citizens become more active and for providing a program that seems to be so good, yet relatively inexpensive"; of 70 year old June, who thinks "...this is a good use of all the equipment and facilities for the people who would not be able to afford these classes, further their education, and it is putting our tax dollars to good use"; of 73 year old Eleanor, who feels that "...it is great that they [the teachers and administrators of the public schools] care about seniors enough to make a program like this available"; and 74 year old Gertrude, who has "One hundred percent positive feelings about the program...The entire community is benefiting. Congratulations for the idea"!

Seniors gave several reasons why they were interested in participating in the

Computing Seniors Program. Other than a generic "to learn about computers" type of answer, the most common responses in order of their frequency were along the lines of not wanting to be left behind or out of the computer age, keeping up with family members, especially with their 6 year old granddaughters, and enhancing their job related skills. "The computer age is here, involving every area of life…" responded one 73 year old student, "…as a nurse still working, I needed to try to stay on top of my career to the extent I can understand. My short study there [at the Computing Seniors Program] was a marvelous beginning".

Almost all of the seniors (59 of 65 interviewed or surveyed) indicated they knew nothing or very little about the nature and function of computers, software and related technologies, and thought that a program designed with them in mind was just what they needed. Interestingly, no one mentioned that they were interested in participating in the program for any social reasons, although anecdotal evidence and comments from the instructors indicated that many seniors looked forward to the weekly classes and did in fact develop new friendships. They seemed to enjoy bringing in and eating cakes, cookies, and other snacks at break time.

Perhaps the best way to sum up the good will generated and the sense of accomplishment felt by the seniors who participated in the program is to share a final testimonial. A husband and wife (ages 71 and 62 respectively), added a special thanks to the teachers and the school which they attended at the end of their questionnaire:

…They [the teachers] let us follow our ideas of what to do with the finished product after we learned how to access certain areas of interest. For example, we were able to make pretty art cards and stationery to show our family and friends. We are both artists and this was a whole new way to experience being creative. I gave my mother and father an Easter card – they were so proud!! (They think I'm still 12 years old – and maybe I am at heart). I gave my girls a copy of an Easter card and they said, "WOW Mom, Good Stuff!" Don made a beautiful letterhead which we took to the Office Max and copied it on pastel paper—looks very refreshing, creative. Thanks for the opportunity.

8.3 The Computing Seniors Experience as it Relates
to the Change Delineator Theory

The Change Delineator Theory suggests that people generally operate out of one or more of the domains of change (creator, translator, innovator, and practitioner) when engaged in the process of change and reform, and that these domains also help to describe the process of change as it occurs in groups, organizations, and societies. The case of the Computing Seniors Program was studied and presented to determine if it contains any or all of the elements of the theory. Is there any evidence in this case of a person or persons functioning out of the creator, translator, innovator, or practitioner conceptual domains? Does the case contain any elements of the theory that describe what happened on an organizational (macro) scale?

8.3.1 Is There Evidence of the Creator Domain?

The data indicated (Editors, 1996; Turner, 1996a, 1996b; Lensch, 1997; Ryan, 1997) that the Computing Seniors Program was the original idea of the principal of Highland Park, who created the concept, applied for the initial grant funds, designed the program, and set the forces in motion to implement the program. As discussed in section 3.3.1.1, the Creator Domain, it matters not whether or not the idea of creating an educational program in public schools designed to teach older persons about computers had ever been thought of or done before. If the idea was original for the individual in question, then that person was functioning out of his or her creator mode. Prior to the creation of the Computing Seniors Program, no one interviewed in the course of the study indicated that he or she had ever before thought of, created, and implemented an educational program designed to meet the unique learning needs of senior citizens in a public school environment. Therefore, this was a novel idea and program on the part of its creator. To some small degree, a new paradigm of utilizing public school facilities, resources, and staff to actively engage and provide educational services to the senior citizens segment of the non-parent community was created within the schools and school districts involved in the study. Once the "new way" had been demonstrated to have positive results at the initiating school, the path was opened for others to follow.

8.3.2 Is There Evidence of the Translator Domain?

The idea of the Computing Seniors would not have gone any further than the originating school had word of the program's popularity and success not been spread to other schools and communities. In this regard, it is suggested that the superintendent of Roanoke City Schools was acting as a translator, and through the power and influence of his position, was able to get other principals to voluntarily adopt and implement programs in their own schools. Certainly, his support for and promotion of the program did not literally require unique and expert knowledge in two technical areas as is described in section 3.3.1.2, the Translator Domain. One could say though, that in his position as leader of the school district, the superintendent probably has greater and more unique knowledge about trends and conditions in the district than do most other employees, and therefore may see the importance of extending the services of the public school system to the non-parent segment of the community before any of the other administrators and school leaders, who are more concerned with the operation of their own departments and schools within the district. For example, the superintendent told principals and others present at an administrators' meeting that he was promoting the Computing Seniors Program in part because he knew that at least 70 percent of the citizens in Roanoke City did not presently have children in the schools, and that it might therefore be increasingly difficult to get future budgetary increases or bond referendums passed if this segment of the community did not perceive the schools as providing direct value or services to them personally. He was in this regard

describing the importance of adopting this kind of school-community engage-ment program in simple terms everyone could understand and relate to—the need to maintain and increase community support and funding. He was acting as the head cheerleader and storyteller in this example of change, which is a secondary function of the translator mode.

8.3.3 Is There Evidence of the Innovators Domain?

While the Computing Seniors Program operated at Highland Park was re-ceiving positive publicity and the accolades of the superintendent, it was never directly said to other principals that they were required to adopt this program. It was made clear by the superintendent that while he encouraged them and would support their involvement, this was strictly a voluntary effort, and there would be no adverse or negative consequences for those schools that did not want to get involved with the project. Three other school administrators (Roger's (1995) "early adopters") initially chose to establish programs in their schools based upon the original Highland Park design, and were joined by an-other thirteen schools (Roger's (1995) "early majority") from within the district the following year. In adopting and applying the program to their own schools, the principals acted in the role of innovator, as they were bringing a new idea into their buildings and school communities and were applying the new infor-mation in the context of their own unique situations. Interview data indicated that these principals believed the Computing Seniors Program would improve the relationship between the schools and the older members of the community.

Some principals and instructors also acted as innovators in a literal sense by making modifications to the program. Several principals indicated that they personally did not make any changes (innovations) to the program, and those operated in their schools still closely resembled the original design. Several others, however, did add some innovations, such as expanding the concept from "Computing Seniors" into "Computing Folks" allowing and encouraging younger neighbors and parents of the school's children to participate; the hiring of middle and high school students and their use in two schools as volunteers to work with the instructional staff in conducting the classes, thus adding an intergenerational factor into the equation; and possibly opening up school media centers after the regular school day for the general public to use the technology in an open lab environment with no direct instruction occurring.

At the program delivery level, most of the instructors said that they had made a number of minor alterations in the instructional program, including slowing down or reducing the curriculum to better meet the needs of their senior students, adding new curriculum components such as lessons in multimedia and the Internet, changing the time frame from holding one class every week for twelve weeks to conducting two classes a week for six weeks, and even dropping the socialization opportunities to allow seniors more practice time working with the technology.

These actions by principals and instructors are examples of individuals acting out of their innovator mode. As Gardner (1995) worded it, the innovator takes a concept or idea "…and brings new attention or a fresh twist to the

story" (p. 10), applying knowledge gained from other sources to solve the practical problems they or their organizations face.

8.3.4 Is There Evidence of the Practitioner Domain?

Practitioners are the people who put newly created ideas and knowledge into everyday application and make the novel concept a regular aspect of their routine operations. The teachers in the seventeen schools within Roanoke City Schools and those in schools outside of the district who have also adopted the Computing Seniors Program, who regularly work out schedules, send out advertising information, develop weekly lesson plans, and instruct in the program week in and week out, are functioning most of the time in their practitioner mode. They may occasionally come up with an idea or method for varying the program to better meet the changing needs of each class of students, and thereby may sometimes act as innovators, but most of the time, in typical practitioner fashion, they are taking care of the regular day-to-day operations of the Computing Seniors instructional program.

8.3.5 Is There Evidence Supporting the Change Delineator
Theory on a Macro (Organizational or Societal) Scale?

The Computing Seniors Program is now a line item in the school district's annual budget, and has therefore become institutionalized, at least in Roanoke City Schools. As a result of the Computing Seniors Program, the educational paradigm in Roanoke City Public Schools concerning "who is the public to be

served" has indeed shifted to some small degree, with the school board, super-intendent, principals, teachers, and many persons from the general public now recognizing the importance of providing learning opportunities to community members other than the traditional K-12 student. Thus, the case of the Computing Seniors Program seems to match the vector diagrams (reference Figures 5, 6, and 7 of section 3.6.3) used to display how the Change Delineator Theory describes change on a macroscopic (organizational or societal) scale.

At the time of the study, the program was in a period of growth and expansion. Therefore, it would appear to fall somewhere on the upward swing segment of the value curve (Example A of Figure 7) described by the Change Delineator. It is impossible to say for how long the Computing Seniors Program will continue to grow within the district or whether or not it will expand to and within others. In time it is likely that it will eventually begin to decline in value (Example B of Figure 7) as an introduction to computers educational program as many persons who are beginning to enter the senior stages of life are already computer literate. However, it is possible that while the Computing Seniors Program may cease to exist, due in part to the paradigm shift it caused, the provision of educational services to senior citizens utilizing the staff, facilities, and resources of public schools may continue in another form.

8.4 Conclusion: Is There any Validity to the Change Delineator Theory?

As stated in the introduction, it is the purpose of this study to bring additional insights to the field of change theory through the proposition of a

theoretical perspective of the roles people play in the process of change, and subsequently, how these roles might affect change that occurs in groups, organizations, and societies. By reviewing and analyzing an example of a small change that has occurred in a particular school district—the Computing Seniors Program—an attempt was made to determine whether or not the Change Delineator Theory describes any aspects of the changes that occurred since the program's inception through its expansion into a district-wide program. Based upon this review, can we say then that there appears to be a degree of validity to the proposed theory? What conclusions can be drawn from the data, the review of the literature, and analysis that has been presented? To answer these questions we must consider whether or not the Change Delineator Theory meets any of the theory validation criteria presented in section 3.1 suggested by Mirriam (1988) and Argyris & Schon (1976). The criteria listed by Mirriam (1988) that are useful for evaluating the quality of a theory are *internal validity, external validity*, and *reliability,* while Argyris and Schon refer to *internal consistency, constancy, effectiveness, congruence*, and *testability.*

According to Merriam (1988), "Internal validity [similar to Argyris and Schon's congruence] deals with the question of how much one's findings match reality. Do the findings capture what is really there" (p. 166)? In other words, does the Change Delineator, as Miles and Huberman (1994) worded it, seem to make sense in describing an actual case where a change has occurred? Can the reader see in the story of the Computing Seniors people operating in the various roles predicted and described by the four domains of the theory? Does

it describe their behaviors and related factors? Does it "ring true…seem convincing or plausible, [or] enable a "vicarious presence" for the reader" (Miles & Huberman, 1994, p. 279)? Based upon the data that was collected and presented during the process of conducting the case study and that which was discussed and analyzed in light of the Delineator domains in the previous section, there do appear to be representative examples in the case that seem to match, at least to some degree, the four domains proposed by the Change Delineator. Therefore, it would appear that the theory does help to describe some aspects of the roles people play in the process of change, suggesting a degree of internal validity to the Change Delineator Theory, at least for this particular case.

"External validity…" stated Merriam (1988), "…is concerned with the extent to which the findings of one study can be applied to other situations….That is, how generalizable are the results of a study" (p. 173)? This is similar to Argyris and Schon's constancy category, which concerns the production of consistent results. Examples given in sections 3.3.1 to 3.3.3 demonstrate that there are many cases in the real world that seem to match the domains of the Change Delineator, examples of people throughout time who have operated out of their creator, translator, innovator, and practitioner modes. Miles and Huberman (1994) ask, among many possible questions to consider when determining external validity, if the study's findings are "…congruent with, connected to, or confirmatory of prior theory" (p. 279)? Yes, other noted experts in change theory have also touched upon or described similar components to those proposed

in the Change Delineator, thus adding to the credibility of its conceptual categories or domains (e.g. Rogers, 1962; Gardner, 1991; and Schlechty, 1997). Therefore, since it does appear to have generalized application in situations other than Computing Seniors, it appears that the Change Delineator does have a level of external validity.

Reliability according to Merriam (1988) "...refers to the extent to which one's findings can be replicated.... Reliability is problematic in the social sciences as a whole simply because human behavior is never static" (p. 170). In tests of reliability, one is looking for consistency in results. If additional known cases of change were studied with an eye on determining whether or not any of the major concepts contained in the Change Delineator Theory were present, and if they were found to be so, then the reliability measure of the theory would be increased.

It would be difficult to conclusively say that the Change Delineator has a high degree of reliability at this time as it has only been shown to have some relevance to the case of the Computing Seniors Program. However, the reader can probably think of other major changes that have occurred throughout history that seem to correlate to the domains and processes proposed by the Change Delineator Theory. One such case that comes to mind is the story of Jesus and the religions that developed around his life, death, and message. His story is commonly known by millions of people around the world. "...Much of what we now think of as Western ideas, inventions and values finds its source or inspiration in the religion that worships God in his name" (Wood-

ward, 1999, p.54). What follows is a very shortened historical version as it relates to the Change Delineator Theory.

Jesus presented the world of His day with a totally new paradigm. Operating out of his *creator mode* (not meant in any religious sense), He proposed a new covenant between man and God, radical in its day to say the least. Because His message was new and different, and also due to his frequent use of metaphors and parables, many of the common people often did not understand what He was talking about. Jesus surrounded Himself with twelve disciples, who, in support of Jesus' mission, *translated* His message into terms the people could better understand, and helped to spread His word throughout the region. Years after His death, a new religion grew around His teachings. Seven different churches vied for dominance in the first few hundred years after His death. The leadership of these churches (bishops, priests, missionaries, and the like) each interpreted Jesus' teaching somewhat differently, eliminating those things they did not agree with and adding or embellishing those they wanted to emphasize. The leaders of these early churches could be considered *innovators*, applying what they believed to be true concerning Jesus' message to solve the problems they faced as they attempted to spread their faith in a predominantly pagan world. The processes of "translation" and "innovation" continue to this day as religious leaders from various Christian denominations interpret the New Testament according to their vision and make changes in church dogma and practice in their efforts to grow and remain viable institutions in society. Finally, and it is no coincidence that regular church-goers are

commonly called *practitioners*, we have the common man and woman, who, if they are faithful, regularly try to follow and put into practice the tenets of their particular school of Christianity.

This anecdotal story of Jesus and the religions that evolved after Him seems to match the Change Delineator's conceptual categories and the vector metaphor it uses to describe the process of change on a macro scale. Similarly, it is suggested to the reader that the history of the creation and spread of Buddhism, the history of the rise and fall of communism, and the more recent story of the creation and domination of Microsoft in the personal computer field, are a few of many examples of change on a macro scale that could possibly be shown to have the components of change as described by the Change Delineator. The application of the theory to other examples of major changes that have occurred in organizations and societies, if its components can be shown to match what has occurred, would add to the reliability of the Change Delineator as a plausible theory for describing the phenomenon of change. Therefore, validity of the theory based upon reliability must be considered a neutral factor at this time pending its further application and study.

Testability generally refers to whether or not a theory's propositions are testable. That is, can a hypothesis or hypotheses be developed and variables be identified from the theory's propositions that when put to the test produce the predicted results. "If it does, the theory has been confirmed; if it does not, it has been disconfirmed" (Argyris & Schon, 1976, p. 25). There has only been one formal test of the Change Delineator Theory thus far. It is a conclusion of

the researcher that in the test case of the Computing Seniors program the major concepts of the theory were found to exist. Therefore, while additional testing of the theory is certainly needed to say so more conclusively, validity based upon testability should be considered a positive factor at this early stage of the theory's development.

Triangulation and peer examination are two strategies that can also be used to determine the validity of a study. Triangulation involves the use of multiple sources of data or methods to confirm the emerging findings, while in peer examination persons knowledgeable in the field being studied are asked to comment on the findings as they emerge (Merriam, 1988).

The Change Delineator does seem to have a small degree of validity based upon an aspect of the criteria of triangulation. If either multiple sources of data or independent sources of information converge to produce similar conclusions, there is an increased likelihood of the theory's validity. As other experienced and knowledgeable experts in the field of change theory such as Boyer (1990), Gardner (1991, 1995), Mehlinger (1995), Rogers (1962, 1995), and Schlechty (1997) allude to one or more conceptual categories in their writings that are similar to the domains described in the Change Delineator Theory, a weak but perhaps promising case for validity based upon the criteria of triangulation can be made for the theory at this time. However, additional independent studies of the application of the Change Delineator Theory to identified cases of change need to be conducted to more definitively determine the theory's validity based upon the criteria of triangulation.

As to validity established through peer examination, this is an area that can only be addressed through future research, development, and application of the Change Delineator Theory, as well as the subsequent publishing of results to enable other experts in the field of change theory an opportunity to review and consider its accuracy as one way of describing the process of change as it occurs in individuals, groups, organizations, and societies. For now, the question of validity based upon peer review will have to be left up to those who will, hopefully, learn about and possibly use it in future endeavors.

In conclusion, the components of the Change Delineator Theory do seem to explain, at least to some degree, what is occurring when the theory is applied to an identified case of change. It also appears to have descriptive power for organizational or societal levels when applied to other examples of change that are not directly related to this study. Figure 13 summarizes the various aforementioned criteria used in this study to determine the likelihood of the validity of the Change Delineator Theory. While one could argue the relative strength or weakness of some of the criteria, since the number of positive validity checks outnumber the neutral or negative checks, the researcher believes that the Change Delineator Theory does appear at this early stage of its development to have sufficient validity to warrant its further development and application to other cases of change.

Validity test or criteria	+	—	0
Congruence: supported by acknowledged experts or other reliable research?	+		
Internal validity: Basic concepts shown to exist in reality?	+		
Consistency?	+		
Triangulation?			0
Reliability ?			0
Testability?	+		
External validity? (Can the theory be generalized to other cases of change?	+		
Transferable to other examples of change?	+		
Elegance (Does it seem like a theory?)	+		
Does it seem to make sense?	+		
Is it easy to understand?	+		
Does it have predictive value?			0
Peer review?		—	
Total +	9		
Total —		1	
Total 0			3

Figure 13. Validity tests summary chart. A plus sign (+) indicates the theory is supported by the criteria or test; a minus sign (-) indicates that the theory is not supported by the criteria or test; and a zero (0) indicates that the criteria or test is either neutral or not applicable to the theory. More pluses than minuses suggests there is probably validity to the Change Delineator Theory.

9. AREAS FOR FUTURE RESEARCH

As was stated above in trying to ascertain the validity of the Change Delineator as a theory that helps to describe the process of change, to really determine whether or not it is an accurate descriptor of any aspects of the process of change will necessitate that the theory be applied to many other examples where an identified change has occurred. The more the theory is applied to and tested against known cases of change, the more accurate a determination can be made as to its validity and reliability. Through such testing, should it continue to accurately describe what is occurring, it becomes a stronger theory and a more dependable predictor of the roles people play in the process of change, as well as identifying the factors leaders should take into consideration when planning to embark upon a change in their schools or organizations.

Secondly, the researcher would like to develop (or see someone else develop) a measurement instrument that would enable leaders to ascertain which quadrants of the Change Delineator domains their employees are operating from prior to beginning a change or reform. If a reliable instrument can be developed that could be easily given to members of an organization, its leadership might be able to use this information to determine the overall readiness of individuals or the entire staff to enter into a period of change and innovation. With such a tool, leaders could identify who on staff might be more creative or more open to innovation, who might be potential "missionaries" of the change, and who would be best suited to just implementing it on a regular basis after sufficient training has been provided and other considerations worked out.

In essence the Change Delineator, in much the same fashion as the Myers-Briggs Type Indicator (1980), the Gregorc Mind Styles Delineator (1985), the LEAD Directions leadership styles profiler (Leadership Studies, 1989), the Keirsey-Bates Temperament Categories (1984) indicator, and other personality profiling instruments, could provide organizational leaders with valuable insights about the readiness of their organization's employees to embark upon a course of change or reform. Such an instrument might also provide a leader with valuable insights into the general environment of his or her organization with regard to creativity and innovation. If many individuals scored higher in the domains of creativity and innovation, a possible conclusion might be that the organization fosters and maintains an open, trusting and supportive atmosphere that encourages experimentation and risk-taking on the part of subordinates. On the other hand, if a great many employees indicated that they spent most of their time operating out of their practitioner mode and felt most comfortable there, a leader might conclude that the organization did not maintain an environment conducive and supportive of change and innovation. In such a situation, the leadership may want to alter the organization's policies, procedures, and atmosphere accordingly before entering into a period of reform. Of course, there might also be other factors that might yield these results. These and other factors would need to be determined in the course of conducting future research on the Change Delineator, with the goal of developing an effective change styles measurement instrument.

10. REFLECTIONS ON BEING BOTH THEORETICIAN

AND RESEARCHER

As was stated in the methodology section, this study's design was somewhat atypical in format and procedure. It was also unusual in that the developer of the theory (the theoretician) was also the primary researcher attempting to begin the process of theory validation by determining whether or not any of the components of the Change Delineator Theory were present in the case of the Computing Seniors Program. This raises the question as to whether or not it may appear to an outside observer that the researcher's objectivity, and therefore his conclusions about the theory's validity, were biased. From a qualitative research perspective the simplistic answer to this question is, of course they are, for as Maykut and Morehouse worded it, "…the knower and the known are interdependent" (p. 12).

Admittedly, the conclusions of the study might be perceived as being more objective if a person or persons other than the theoretician studied an identified case of change in an attempt to begin the process of theory validation. However, appearances aside, being both the theoretician and researcher does not necessarily diminish the objectivity of the work nor of the study's conclusions. Any theoretician who attempts to validate either his own work or that of another does, either knowingly or unknowingly, bring his personal biases into the study, regardless of whether quantitative or qualitative techniques are utilized. "Insiders, outsiders and researchers each bring a perspective to that which is being studied" (Maykut & Morehouse, 1994, p.124).

Theory development is, by its very nature, highly susceptible to researcher bias. As a theory is in the simplest sense a plausible explanation for an observed phenomenon based upon one's perception of the reality surrounding the thing in question, it may be virtually impossible to ever have a truly objective theoretical development study based upon the principles of qualitative research. "Qualitative researchers understand..." stated Maycut and Morehouse (1994), "...that they are also subjects or actors and not outside of the process as impartial observers. Subjective researchers are exposed to the same constraints in understanding the world as are the persons they are investigating" (p. 20). In conducting qualitative research, we are seeking to add to the knowledge base by discovering or developing patterns and propositions that have meaning and enhance understanding. Perception, analysis, and explanation are integral aspects of this process and therefore, inherently bring one's prior knowledge, experiences, and biases to the equation. We all have our biases, and we typically seek to have our perspectives affirmed, especially in the course of making generalizations. "People...are far more likely to see *confirming* instances of original beliefs or perceptions than to see disconfirming instances, even when disconfirmations [may be] more frequent" (Miles & Huberman, 1994, p. 263).

At this very early stage of the development of the Change Delineator Theory there appears to be evidence that it may have some validity in describing the process of change as it occurs in individuals, organizations, and societies. However, much work is needed by other researchers who were not directly in-

volved in the theory's proposition to increase its legitimacy and explanatory power as a plausible descriptor of the process of change. "If you want to stand back and review critically [a proposed theory or other research conclusion], you need someone else to do it—or you must build in safeguards against self-delusion" (Miles & Huberman, 1994, p. 265). It is suggested to any persons who may take up the quest of further refinement and validation of the Change Delineator Theory that they should, as recommended by Miles and Huberman, include the safeguards of increasing the number of cases of change reviewed, including contrasting cases, and selecting cases of change to be studied randomly. Utilizing such an objective process, additional study will, hopefully, result in other researchers coming to conclusions that objectively and independently substantiate the Change Delineator Theory as a valid descriptor of certain aspects of the change process.

Interview and Questionnaire Conceptual Categories

1. Contextual and historical information

2. Motivational factors

3. Prior knowledge

4. Program format and Learning needs

5. Program impact, costs, and benefits

6. Innovation and change

APPENDIX B

Table B.1

Research Questions and Corresponding Conceptual Categories

Question	Conceptual Category
1. How does the Change Delineator Theory help to explain aspects of the process of the change(s)that occurred in the case of the Computing Seniors Program?	Innovation & Change
2. What evidence, if any, is present in the case of the Computing Seniors Program that might indicate that any person's actions may have resulted from his or her functioning in one or more of the cognitive performance categories or domains (Creators, Translators, Innovators, Practitioners) described by the theory?	Innovation & Change
3. What is the history of the creation, implementation, expansion, and institutionalization of the Computing Seniors program?	Contextual/historical Information; Program

(*table continues*)

Table B.1 *(continued)*

Question	Conceptual Category
a. Who was involved...?	format/learning needs;
b. How was the program funded...?	Innovation & Change
c. How is the program expanding...?	
d. Where any changes incorporated...?	
4. What characteristics or other factors can be identified that should be taken into consideration when creating and conducting an educational program designed to meet the earning needs of seniors citizens in a public school environment?	Program format and learning needs; Prior knowledge
5. What are the costs and benefits derived by a school from conducting the Computing Seniors Program?	Program impact, costs, and benefits
6. What are the benefits derived by older persons from participating in the Computing Seniors Program?	Program impact, costs, and benefits

Table B.1 *(continued)*

Question	Conceptual Category
7. How has the Computing Seniors Program helped to promote better relations between schools and the seniors citizens community?	Program impact, costs, and benefits; Innovation & Change

Table C.1

Data Sources for Computing Seniors Case Study

Sources	Conceptual category
1. Adams, K. (1996, January 15). Seniors surf the 'net. The Roanoke Times, E1.	Contextual/historical & Motivational factors
2. Editors. (1996, March 25). Editorial: Public schools revisited. The Roanoke Times, A4.	Contextual/historical, Motivational factors
3. Editors. (1998, March). Magna awards. American School Board Journal, 185 (4), A31.	and Program impact
4. Lensch, J. (1995, November). Application for administrative mini-grant. Unpublished grant application, Roanoke City Public Schools	Contextual/historical
5. Lensch, J. (1997, February). A high-tech magnet for seniors. Educational Leadership, 54 (5), 64-6.	Contextual/historical & Program impact

(table continues)

Table C.1 *(continued)*

Sources	Conceptual category
6. Lensch, J. (personal notes, November, 1995-December, 1997).	Contextual/historical
7. Opperman, G. (1997, December). (Computing Seniors to get boost from TLS Media). Unpublished press release.	Contextual/historical & Program impact
8. Roanoke City Public Schools. (1997b, Fall). Attractions. (Newsletter). Roanoke, VA: Author.	Contextual/historical & Motivational factors
9. Roanoke City Public schools. (1997c, September). Computing Seniors curriculum guide. (Un-published guide). Roanoke, VA: Author.	Program format and learning needs
10. Roanoke City Public Schools. (n.d.). Computing seniors: A practical guide to starting a Computing Seniors Program in your school. (Brochure). Roanoke, VA: Author.	Contextual/historical and Program format

(*table continues*)

Table C.1 *(continued)*

Sources	Conceptual categories
11. Roanoke City Public Schools. (End of course evaluations from CS students, January, 1996 – May, 1997).	Program format and learning needs; Program impact
12. Roanoke City Public Schools. (1996, September). New horizons 2 (2), 6. (Newsletter). Roanoke, VA: Author.	Contextual/historical and Motivational factors
13. Roanoke City Public Schools. (1997a, February). New horizons, 3 (1), 2. (Newsletter). Roanoke, VA: Author.	Contextual/historical and Motivational factors
14. Ryan, M. (1997, August 17). Who says you have to be young to love a computer? Parade Magazine, 22-23.	Program impact
15. Turner, J. (1996a, March 20). Seniors: It's never too late to learn. The Roanoke Times, C1, C5.	Contextual/historical, Motivational factors, and Program impact

(table continues)

Table C.1 *(continued)*

Sources	Conceptual categories
16. Turner, J. (1996b, November 7). Computer age meets old age. <u>The Roanoke Times</u>, C1, C4.	Contextual/historical, Motivational factors, and Program impact
17. Interviews with principals	
18. Interviews with C.S. Instructors	Contextual/historical, Motivational factors, Program impact, and
19. Interviews with C.S. participants	Innovation & Change
20. Interview with superintendent	
21. Questionnaires mailed to senior students in various CS programs who were not interviewed	Contextual/historical, Motivational factors, and Program impact

Principal's Interview Questions

	Category

P.1. Is your school an: elementary, middle, or high school?

P.2. When did you begin a Computing Seniors (CSs) program at your school?
How many courses have been conducted?

P.3. Approximately how many seniors have participated (total number since
beginning the program)?

Contextual/ Historical Information

P.4. Describe how you promoted the program.

P.5. Why did you begin a Computing Seniors Program at your school?

P.6. Tell me how the program got started at your school.

Motivational Factors

P.7. Who was involved in getting the program started at your school?

P.8. How do you feel about using your staff, facility and resources to conduct
an educational program for non-traditional students like senior citizens?

P.9. How familiar are you with demographic and population trends and
projections for the next 30 years?

Prior Knowledge & Prog. Format & Learning needs

P.10. What do you know about the mental, physical or other learning needs
of older persons (e.g. persons aged 60 or more)?

P.11. Have the senior participants had any relationship or impact on your
regular students? If so, please describe.

P.12. What benefits, if any, has your school accrued by hosting a Computing
Seniors program in your school?

Program Impact/ Costs/ Benefits

P.13. Please describe what you believe to be the benefits of the CS program to
senior participants.

P.14. Describe any disadvantages or problems that may have arisen as a
result of hosting this program at your school.

P.15. Think about how change or reform occurs in your school. Tell me a little
about the process.

P.16. What, if any, modifications have you made to the program since its
inception to better meet the needs of your school or your senior
participants?

Innovation & Change

P.17. Has your participation in or experience with the CS program stimulated
your thinking about other ways of involving seniors in your school?

P.18. Has your participation in or experience with the CS program stimulated
your thinking about other kinds of school--community involvement programs?

Table D.1

Validation Results for Principal's Interview Questions

Questionnaire Question Number	Research question number items relate to:								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**None**
1	2	2	1	1	1	1			3
2	1	7		1					
3	1	7							
4	1	6	1	1	2				
5	5	2	1	5	2	2			
6	2	7	1					1	
7	1	5	1						2
8	7	2	2	4	2	3			
9	4	1	4	1	1	2			
10	4		7	1	2	1			
11	3		2	3	2	4	2	1	
12	4			6	1	1	1	1	
13	3			2	7	1	2	1	
14	2	2	3	6	1	1			
15	2	2	1	1			5	5	
16		4	3	1	1		4	1	
17	3	1	2	2	3	4	2	2	
18	4	1	2	1	2	1	2	3	

Note. The numbers under the "research question number" columns are the number of re-
sponses from the readers who thought that the question would generate data relevant to
the corresponding research question. A high the number in a column indicates that many
readers thought that question would likely generate the information desired. The numbers
do not equal 7 (the number of readers) due to some readers giving multiple responses.

Instructor's Interview Questions

	Category
I.1. How many Computing Seniors (CSs) courses have you conducted? About how many senior students have you taught?	Context/
I.2. How many seniors on average were in each class? How many staff persons helped to conduct the classes?	Background
I.3. Describe how you first became aware of the Computing Seniors Program?	Motivation
I.4. What prompted you to become and instructors in the CSs program?	
I.5. Prior to teaching these classes, describe what you knew about the physical, mental or other learning needs of senior citizens?	Prior Knowledge
I.6. Describe any differences you observed in learning styles among your senior students:	
I.7. What kinds, if any, of special accommodations did you have to make for any of the seniors who were in your classes?	
I.8. How long were each of your CS's class periods? Was this too short, too long, or about right?	Program Format/ Learning
I.9. How many total sessions were contained in a course/semester? Was this too few, too many, or about right?	needs
I.10. Briefly compare and contrast your experience in teaching younger students with teaching seniors:	
I.11. Discuss your overall impression of the experience of working with older students in a public school setting?	
I.12. Were the initial curriculum materials and guidelines you received sufficient? What modifications to the curriculum materials did you make?	
I.13. What, if any, new program features or innovations did you add to the CSs program conducted in your school?	Innovation & Change
I.14. What would you do differently if you were to conduct another CSs course?	
I.15. What do you believe are the benefits derived by the senior participants in the CSs program?	Program impact/
I.16. What benefits has your school derived from conducting a CSs program?	Costs/ Benefits
I.17. What benefits have you derived from conducting the CSs program?	

(Appendix continues)

	Category
I.18. All things considered (class hours, planning and preparation time, total workload, salary, etc.) would you conduct another CSs course? Why or why not?	Program impact/
I.19. Do you have any other recommendations or general comments concerning your experience in teaching the Computing Seniors Program that have not been addressed in the preceding questions?	Costs/ Benefits

Table E.1

Validation Results for Instructor's Interview Questions

Questionnaire Question Number	Research question number items relate to:								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**None**
1	1	7							
2	1	6	1	1					
3	2	7							
4	4	2	2	3	2	3	1	1	
5		1	6	1	1	1			1
6			5		1				
7			6	2	2				
8		2	6	1	1				
9		2	5	2	2				
10			4	2	2		1	1	1
11	2		1	2	2	3			2
12		5	4	3	1	1			
13		5	2		1		2	1	
14		4	4	2	2	1	1	2	
15	2			2	7	2			
16				6	1	4	1	1	
17	2			3		2	1	1	1
18	2	2	2	4	2	3			1
19	2	3	1	2	1	1		1	3

Note. The numbers under the "research question number" columns are the number of re-sponses from the readers who thought that the question would generate data relevant to the corresponding research question. A high the number in a column indicates that many readers thought that question would likely generate the information desired. The numbers do not equal 7 (the number of readers) due to some readers giving multiple responses.

Senior Participant's Questionnaire

	Category
S.1 Why are (or were) you interested in participating in the Computing Seniors (CSs) program?	Motivation Factors
S.2. What are your personal goals as a student in the CSs program?	
S.3. How did you learn about the availability of the program?	Contextual/ Historical
S.4. Prior to participating in Computing Seniors, what did you know about computers and related technologies?	Prior Knowledge
S.5. Do you own or have access to a computer? If so, what kind?	
S.6. What are some of the benefits you received from participating in the program?	Program Impact/ Costs/ Benefits
S.7. What is your opinion about schools that make their facilities and equipment available after the regular school day for the community to use like our school district is doing with the Computing Seniors Program?	
S.8. What was your impression of our school district prior to participating in the CSs program? Is your impression still the same after becoming involved in this program?	
S.9. Have you ever volunteered in a public school? As a result of participating in the Computing Seniors Program, would you be more inclined to volunteer? Why or why not?	
S.10. About how long were the class sessions you participated in? Were these too short, about right, or too long?	Program Format/ Learning Needs
S.11. Did you receive enough personal help and assistance when you needed it?	
S.12. Was the amount of material covered in a class too much, about the right amount, or not enough?	
S.13. Was the classroom environment (lighting, temperature, noise, etc.), furniture, and facility comfortable for you, or did the setting cause you any difficulties?	
S.14. What suggestions would you have concerning making the program better for the next set of classes for seniors?	Innovation & Change
S.15. What other kinds of programs for adults would you like to see held in public schools?	
S.16. What additional comments or suggestions about the CSs program might you have that have not been addressed in any of these questions?	

Table F.1

Validation Results for Senior Participant's Questionnaire

Questionnaire Question Number	Research question number items relate to:								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**None**
1	2	3	1		5	3			
2					6	1	1	1	1
3		7							
4		1	4		1		1	1	1
5			4		1	1	1		2
6				1	6	2			1
7				2	3	6			
8						6			
9				1	2	7			
10		2	5		1				
11		2	2		3				2
12		1	5	1	2				
13			6	2	1	1			
14			4		3	2	1	1	1
15	3				1	3	1	1	1
16	1				1	1			5

Note. The numbers under the "research question number" columns are the number of responses from the readers who thought that the question would generate data relevant to the corresponding research question. A high the number in a column indicates that many readers thought that question would likely generate the information desired. The numbers do not equal 7 (the number of readers) due to some readers giving multiple responses.

Superintendent's Interview Questions

	Category

P.1. When did you first become aware of the Computing Seniors (CSs) program?

P.2. Who was involved in getting the program started in your school district?

P.3. Which schools were among the first to get involved with the CSs program? How many schools are currently participating in the program?

P.4. How many seniors would you estimate have participated in the program?

(Category: Contextual/ Historical Information)

P.5. Why did you initially support the Computing Seniors Program?

P.6. What did you do to promote the program in your district?

P.7. How do you feel about using the district's staff, facility and resources to conduct an educational program for non-traditional students like senior citizens?

(Category: Motivational Factors)

P.8. Discuss what you know about demographic and population trends and projections for the next 30 years?

P.9. What do you know about the mental, physical or other learning needs of older persons (e.g. persons aged 60 or more)?

(Category: Prior Knowledge Prg. Format & Learning needs)

P.10.   Have the senior participants had any relationship or impact on the regular students in the district? If so, please describe.

P.11. What benefits, if any, has the school district accrued by sponsoring the Computing Seniors Program?

P.12. Please describe what you believe to be the benefits of the CS program to senior participants.

P.13. Describe any disadvantages or problems that may have arisen as a result of hosting this program in your district's schools.

(Category: Program Impact/ Costs/ Benefits)

P.14.   Think about how long term change or reform occurs in your school Division. Tell me a little about how you go about creating changes you think are necessary.

P.15.   Inertia is a form of resistance to change. What do you do to overcome inertia when attempting to initiate a change or reform?

P.16.   Entropy is the tendency of systems to move towards randomness and perhaps chaos if there is insufficient energy or resources to maintain a steady state. Do you see this as a factor in establishing and maintaining long-term change or reform, and if so, what do you do about it?

(Category: Innovation & Change)

(Appendix continues)

Category

P.17.   Discuss how your experience with the CS program has stimulated
         your thinking about other ways of involving seniors in your school
         district.   Innovation
                                                                                      & Change

P.18.   Has your participation in or experience with the CS program
         stimulated your thinking about other kinds of school–-community
         involvement programs? If so, please describe.

Table H.1

Relationship of Data Sources to Research Questions

Research Question	Data	Source(s)	Data Analysis
1. How does the Change Delineator Theory help to explain the change(s) that occurred in the case of the Computing Seniors Program?	The case study & literature review	All data and info.	Analysis of the case study, logical deduction & inference
2. What evidence, if any, is present in the case of the Computing Seniors Program That might indicate that any person's actions may have resulted from or were influenced by his or her functioning in one or more of the cognitive performance categories or domains described by the theory?	The case study & literature review	Responses to questions P.5, P.6, P.14, P.16, I.10. I.11 All data sources	Analysis of the case study, logical deduction & inference
3. What is the history of the creation, implementation and expansion of the Computing program? Who, how, etc.	Items 1-15 from list of data sources	General information responses to questions P.2, P.3, P.7, I.1, I.3, S.2	Narrative table summarizing frequency of responses
4. What characteristics or other factors concerning older persons must be taken into consideration in creating conducting an educational program designed to meet the learning needs of senior citizens in a public school environment?	Same as above, plus Literature review course materials	Responses to questions P.9, P.14, I.2, I.3, I.4, I.5, I.6, I.7, I.8, I.10, I.11, I.12, S.1, S.3, S.4, S.11, S.12, S.13, S.14, S.15, S.16	Same as above Narrative
5. What are the costs and benefits derived by the school for conducting ducting a program like Computing Seniors?	Interviews with superintendent principals, and Instructors; Questionnaire Responses	Responses to questions P.10, P.11, P.12, P.13, I.13, I.14	Table summarizing frequency of responses

(*table continues*)

Research Question	Data Source(s)	Data	Analysis
6. What are the benefits derived by older persons for participating in a program like the Computing Seniors?	Interviews with the students; Questionnaire Responses	Responses to questions S.1, S.5, S.7, S.9, S.10 I.12	table summarizing frequency of responses
7. Has the Computing Seniors program helped to promote better relations between schools and the seniors citizen and general communities?	Same as above	Responses to questions P.5, P.8, P.14, P.15, P.16, S.6, S.7, S.8	Same as above

Note: P = principal question number
        S = Senior participant question number
        I = Instructor question number

Summarization of Interview, Questionnaire, and Document Data

I.1 Similar Responses to Conceptual Category: Contextual and Historical
    Information

PRINCIPALS:

1. 2-instructors; advertised in school news letter, local newspaper; have had about 30 participants thus far

2. sent out memo to parents; school newsletter, personal contacts; have had about 12 participants thus far

3. sent out mailings, put up posters, school newsletter, spoke to church group; have had about 60 participants thus far

4. spoke to churches in area, school newsletter; have had about 30 participants thus far

5. school newsletter, sent note home, word of mouth; have had about 14 participants thus far

6. sent into to local churches and community organizations, word of mouth; had about 75 participants thus far

7. sent home fliers, word of mouth; have had about 40 participants thus far

8. sent home notice, sent notices out to local churches; have had about 28 participants thus far

INSTRUCTORS:

1. conducted 5-6 classes; worked with about 90 seniors; 2 hour classes, 12

(Appendix continues)

per course, average of about 18 seniors per course; two teachers conducted the classes

2 & 3. (joint response) conducted 2 course for about 29 seniors, averaging about 15 per course; two teachers conducted classes

4. taught 1 class for about 15 seniors

5. conducted 2 courses for about 36 seniors, 24 in one class, 12 in the other; two teachers taught the classes, usually with a third assistant

6. taught two courses for about 17 seniors, with 8-9 per course; once with another teacher, once with an aide

7. taught one course for 7-8 seniors; with 1 additional teacher and 1 H.S. student assistant

8. taught 3 courses for about 40-45 seniors, averaging 17-18 per class; use one teacher with about 2-4 student assistants

9. taught 5-6 courses for about 60-65 seniors, averaging about 15 per course; worked with another teacher; 2 hour classes

10. conducted one course for about 24 seniors, averaging about 22 per class; no assistants; 2 hour classes

11. taught one course for about 23 seniors, averaged about 20-21 per class, 2 hour classes, no assistants.

12. taught one course for about 16 seniors, averaging 16 per class; 2 hour classes; one teacher and one assistant.

(Appendix continues)

SUPERINTENDENT:

Aware of program for almost 3 years; have 17 sites in district; who initiated program? "Clearly initially it was your work, John, to get it started here at this school" (referencing Highland Park); "It became an initiative that was supported by my office". "We probably have over 300 citizens who have participated now". "I also think it is good business to share the technology that has been paid for by taxpayers' money with citizens…".

STATEMENTS FROM DOCUMENTS

"The other must go to Highland Park's principal, John Lensch, for coming up with the program" (Editors, 1996, p. A4).

"Lensch says he created the program because he considers the school a community resource that should be available to others in the neighborhood" (Roanoke City Schools, 1997b, p. 3).

"The Roanoke City Schools approved the proposal, and in November 1995 we received a mini grant of $500 to establish a pilot program at Highland Park Learning center" (Lensch, 1997, p. 64).

"The class is an expansion of a program began a year ago when Highland Park learning Center started a class for elderly residents in the neighborhood" (Turner, 1996b, p. C4). Park learning Center started a class for elderly residents in the neighborhood" (Turner, 1996b, p. C4).

"Highland Park Principal John Lensch, who came up with the idea, said the classes are an opportunity for elderly residents to join the information age" (Turner, 1996b, p. C4).

"The program expanded during the 1996-1997 school year to include each of the four city quadrants with programs at Highland, Huff Lane, Fallon Park, and Roanoke Valley Governor's School" (Roanoke City Public Schools, n.d., p. 2).

Similar Responses to Conceptual Category: Motivational factors

PRINCIPALS:

1. A good way of promoting the educational goals of the school system and make the school accessible to people who don't have a stake in the educational community; a chance to show that even if you don't have kids in school, school can do something for you directly… especially taxpayers and retired people…who would ordinarily have no real stake in public education.

2. To get the community more involved in the school; I felt it was important that we reach out more to our community; when parents and the community are more involved, negative (student) behavior declines.

3. We have an outreach program as a part of our mission; we were already moving in that direction; it's a more intelligent use of our resources.

4. It is an interesting way to open a school up; a thing of wanting to give to the community but at the same time knowing it would probably help our kids; we did not feel coerced; the building sits empty for too many hours and what better way to open it up than for something like this; it was an extension of what we were already doing.

5. We wanted to provide a service to the community and to get the school connected to a segment of the population that has little contact with us; I also believe in making greater use of the facility. The superintendent told us about the program at a meeting, that he thought it was a good idea and that he

(Appendix continues)

would support its expansion if other schools wanted to get involved. It's a
 positive thing for our school.

6. We have a church partnership that has a lot of elderly members…we were
being frequently asked by them to provide a program for them, so we were
naturally moving in this direction; school should be a community place, offer-
ing a continuum of services from those for children through old age…a place
where everyone is welcome.

7. It was an initiative of John Lensch, the superintendent endorsed it and sug-
gested it would be a positive avenue to bring in the community, and with the
support of the superintendent and a nice stipend for the instructors, we pur-
sued getting the class started. Anytime we can open up our building to the
community, its going to make the school a stronger aspect of the commu-
nity…make it more of "our school" as opposed to "the school".

8. The superintendent mentioned it to our PTA and I saw it as a good school-
community involvement effort. I felt there was a little bit of coercion, I know
that the superintendent liked it and that this was something we probably
should offer…I also like the rationale of connecting the school to the older, re-
tired population. All the pieces were there and I had a teacher willing to do it.

INSTRUCTORS

1. When I came into the building over the summer to get to know the (new)
principal, he told me this was an interest of his, to start the program here, and

(Appendix continues)

asked me if I would put some thought into it…then he gave me a copy of the

Parade article…I said yes, I would be interested…He's a new principal on the

block and I though it might be a good idea to say yeah, this is something you

want to do and I'll do that…

2. no response data

3. The principal asked me if I'd be interested in trying a seniors program

here…I thought it looked interesting from what I had seen done so I though I'd

like to try it.

4. I attended an inservice awareness session so I investigated it further…I

really enjoy working with computers and working with seniors too, so it was a

natural match for me.

5. The principal mentioned it at a faculty meeting and asked for volunteers to

go to an informational meeting. It sounded like a great idea and I've been in-

terested in exploring the idea of teaching adults.

6. I heard about it from John Lensch…the principal brought the idea back to

the school…I thought it was worthwhile if we could get more community in-

volvement. I was not coerced to teach it.

7. I was aware of it from faculty meetings and we had previously had a section

run here…it was an opportunity to earn a little extra money and it was also a

different area than what I usually instruct in…it was a good opportunity.

8-12: Note: Responses from the remaining five instructors indicate that 4

(Appendix continues)

volunteered, one gave no response on this item.

SUPERINTENDENT:

It was a great idea. This is an excellent way to open up the schools to the entire community…a way to say come in, this is your school…a way to get those individuals engaged. I endorsed the idea that you (speaking to John Lensch) brought forward by saying it's a great idea and yes I will provide some financial support for you to get this done at your school and then encouraged others, made an announcement at a principals' meeting, talked about it at senior staff and said its my goal to expand the Computing Seniors Program from Highland…to every school within two years. I have been vocal in my support of it in the State of the Schools Address and will continue to say to this community, these are your schools, we want you to be a part of it. It is what we should be about.…In this age, when everyone needs to become technologically literate, we should be using every resource we have to make sure every citizen in the community has an opportunity to learn how to use technology.

STATEMENTS FROM DOCUMENTS

"Thus, principals and other school leaders are looking for ways to restore the public's confidence in and support for public education and to reestablish a positive sense of community" (Lensch, 1997, p. 64).

"But senior citizens can be a valuable ally if we develop creative ways to reconnect them with the public schools" (Lensch, 1997, p. 64).

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"...but this is really a program put on by the local school districts. The

school districts love to get involved because it really gives them a way to get the

surrounding community involved in the educational process, an issue they face

every day" (Opperman, 1997, p. 1).

Similar Responses to Conceptual Category: Prior knowledge of
Demographic Trends and Needs of the Elderly

PRINCIPALS

1. not much, although I suspect that we're going to have an older and older

generation, also a lot of unemployed people.

2. There is an increase in our student population; it is becoming more non-

white; the baby-boomers will be hitting the social security era; we'll be living

longer.

3. I'm very knowledgeable of the country's changing demographics and the

aging of the population.

4. I didn't know much about the aging process prior to the computing

seniors program.

5. limited knowledge of that.

6. I'm very familiar with the needs and characteristic of the elderly.

7. The population is getting older, but I don't know a lot about it to any great

extent.

8. I understand that the baby boomers are going to retire and that social secu-

rity and Medicare systems are going to go defunct, and beyond that, I don't

know how much you're asking.

INSTRUCTORS

1. Very familiar with the needs of seniors/older persons; have had coursework

on adult aging; took care of my aging grandparents

(Appendix continues)

2. experience from my own family.

3. Very familiar; I have had a lot of experience working with senior citizens.

4. none

5. no specific classes nor any expertise in this area; what knowledge I do have comes from knowing some through our church.

6. no, not specifically; I don't have much knowledge about their learning needs.

7. Beyond working with my parents…I probably was as prepared as most people my age; I recognize that they are going to have difficulty with manual dexterity, hearing and seeing – traditional instructional method s won't work – you have to come up with different approaches to deal with that environment.

8. I had some college classes on aging and worked part time in a nursing home; working with seniors is similar to working with younger students in terms of techniques and methods designed to meet their needs.

9. Somewhat familiar. I was surprised by their lack of keyboarding skills.

10. Only slightly familiar

11. average knowledge

SUPERINTENDENT

Superintendent's answer focused upon changes in student population, e.g. more immigrants and ESL students, slight increase in overall student population; did not address aging of the population.

STATEMENTS FROM DOCUMENTS

No document data found for this domain of inquiry.

Similar Responses to Conceptual Category: Program Format
and Learning Needs

PRINCIPALS:

1. book knowledge, none; but I have experience with parents (as they got old)

2. They need to be interacted as with anyone; they need real experiences, having a rationale, having it purposeful.

3. hearing, vision, and mobility problems increase as one ages; we need to use a multimodal approach as we do with 3 year olds; incredible patience is needed. What I know about aging is mostly from dealing with the needs of my 77 year old mother.

4. My husband and I own a small nursing home, so I'm very familiar with the needs and characteristics of the elderly.

5. I think there is a natural hesitancy or fear of the unknown in that age group. We try to make the program as non-threatening as we could; we slowed the pace of instruction, slower that we do for younger people.

6. Very familiar—I used to work with elderly patients at a hospital in a former position I had.

7. I feel that seniors citizens are similar to any other age group.

8. They are as capable of learning as well as others, except maybe at a slower pace; Alzheimer's and other dementia affect a smaller part of the aging population than what people think; Most people in their senior years are more able than society thinks, both physically and mentally.

(Appendix continues)

INSTRUCTORS:

1. They're pretty much like the kids… need hands-on and actively doing; need a lot of repetition. They are very demanding and impatient; some have problems with eyesight and hearing. Problems operating the mouse – poor eye-hand motor coordination. They are very appreciative; classes last 1-1/2 to 2 hours.

2. I didn't see any differences; didn't need to make any accommodations

3. You have to be much more methodical with the seniors than you do with children; give them directions in writing; several had a hard time walking; one was hard of hearing; have a great deal of experience to draw upon and is therefore easier to provide concrete examples for them.

4. I saw a variety of learning styles just like with younger children; they are very willing but easily frustrated; they are not willing to ask questions; I have to really check for understanding; Need enlarged materials; problems with using the mouse; could not practice at home (no access to computers); they can compensate for weakness better than kids can.

5. Seniors have more motor problems than do the children; difficulty with the mouse; need a lot of 1:1 help; they don't ask questions—don't want to look stupid; children are more likely to admit mistakes; children more likely to blame the computer, while the seniors will blame themselves; seniors not willing to play or experiment; they were worried about doing the right thing.

6. They have to do a lot of hands-on; some were afraid to touch the computer for fear of breaking it; they were very curious about it; some had problems seeing the board; many had difficulty coordinating the mouse with what they saw on the screen; involuntary hand movements were a problem; had a wide range of abilities in the classes; they loved most doing creative things; couldn't go home to practice; are eager learners; have more self discipline than do younger students; some have difficulty perceiving what is going on.

7. Many similarities to the children – they need repetition, drill and practice; they like to play computer games; seniors get frustrated more easily than do the children; they sometimes "snap at you" out of frustration; however their desire to learn never wanes, they don't want to stop. Many seniors have difficulty with the mouse; pointing and clicking at an icon is difficult for them to coordinate; they have a problem synchronizing the mouse with the movement of the pointer on the screen; there is a great deal of variation in their needs and abilities; noticed hearing and seeing problems with many; we provide written details and guidelines -- we can't assume they understand; many won't ask questions or ask for help.

8. Some need up close, personal attention, some need everything written down, and some don't; some need to have things demonstrated to them; using peer relations works -- well they help each other a lot; identified hearing, sight problems, and the "shakes", but no major problems that couldn't be

(Appendix continues)

compensated for in the class. Younger students pick up things more quickly; seniors attention span is about the same as a fourth or fifth grader; they want to chat a lot and they get off task quickly.

9. some caught on immediately to everything. Many needed much attention. Some never did learn. A lot of whining and complaining, but more appreciative than the children.

10. no answer

11. no answer

SUPERINTENDENT:

For anyone over 55, it is critical that they stay physically and mentally engaged and alert. This is not based upon any scientific evidence…I can speak to that point because of my mother….

STATEMENTS FROM DOCUMENTS

"As with any class of students, we found that our seniors presented a range of abilities….Several students found that their unsteady hands made it difficult to control the mouse….We eventually added a second helper to the weekly classes to assist those who were having difficulty or who went at a slower pace" (Lensch, 1997. P. 65).

Similar Responses to Conceptual Category: Program
Impact, Costs, and Benefits

a. Impact on Regular Students

PRINCIPALS

1. Not to my knowledge, don't think there is interaction.

2. Basically, no.

3. We've realized some increased mentorships;

4. Definitely had an impact; they tutor and work with them; we're seeing
   our parents coming, (having) a real interest from them on how to improve
   their own child's learning.

5. no answer

6. Some impact as volunteers and tutors. Good community relations helps
   the school and thus the children.

7. none I am aware of

8. some minor positive impact on the children

INSTRUCTORS not asked about the impact on the younger students

SUPERINTENDENT

Its an intergenerational encounter.

STATEMENTS FROM DOCUMENTS

"The students are working with the elderly residents to help meet community c

requirements for an IB diploma….the community service enables the students

to learn more about their community, and the community benefits

(Appendix continues)

from their skills and talents" (Turner, 1996b, p.C4).

"The seniors primarily were accessible, and the intergenerational opportunities for the school children was felt to be most valuable....Most of these seniors volunteered to come and work with the school this year, and many participated in the school's math activities" (Roanoke City Public Schools, 1996, p. 6).

b. Benefits to School

PRINCIPALS

1. Its given the school a reputation as one that cares about people in the community of all ages.

2. They were excited to know that this kind of education was available to the (young) students.

3. Some materials have been given to the school. Higher visibility and identity of the school in the community; increased publicity.

4. Benefits come directly back to the children; has been beneficial for the staff because now they are looking towards the technology as a valid teaching tool.

5. Its raised the competency level of the instructor; also good for staff development – the teachers see the seniors working on the computers and are motivated to learn more about them.

6. Helped to build a community comfort level with the school; has helped justify the expense of the technology; we've gotten more volunteers; has

(Appendix continues)

helped build communication between the generations; gotten some good press and improved public relations.

7. increased good will and improved public relations and reputation with the community.

8. public gets the feeling that the school is more open, less of an institute or building, but more of a community resource, a community center.

INSTRUCTORS

1. some good PR; get to know where their tax dollars are spent.

2. an increase in volunteers, more support for the school in general

3. They are very impressed with RCS as a whole for offering this. They got a better feel for where their grandchildren go to school.

4. Increased community awareness of and appreciation for what the school has and does; we've gotten two volunteers.

5. generates familiarity with the school system; if we're here for them, they'll be here for us; increased enthusiasm about education; we'll probably see an increase in volunteers.

6. a lot of visibility in the community; seniors get a better idea of what we're all about.

7. positive feeling about the school; got a couple of volunteers; we got good publicity.

8. they look real positive on the school for offering the class; outsiders are

very impressed with RCS for offering the program to them as well.

9. good community relations and we got a few volunteers.

10. improved public relations

11. no response

SUPERINTENDENT

It has had a tremendous impact and they are speaking positively about this and (are) telling others.

STATEMENTS FROM DOCUMENTS

"As a vital constituent in supporting public education either directly as a volunteer or indirectly through the tax base, it is important to engage our older citizens in the educational process" (Roanoke City Public Schools, 1997a, p. 2).

"Once the Computing Seniors program was established, a reporter from the local newspaper visited and did a feature story about it. The article provided positive publicity for the school and generated interest from senior citizens throughout the Roanoke Valley. A few weeks later, the newspaper published an editorial that complemented the school for helping to reestablish a sense of community in the neighborhood and for bridging the generation gap" (Lensch, 1997, p. 64-65).

"The program has also had an unexpected byproduct: more seniors are volunteering to tutor and read to children and to help the school staff through a variety of support roles" (Lensch, 1997, p. 66).

(Appendix continues)

"One side benefit for public education: This sort of use gives older residents another reason to support schools—helping them to keep in touch not with just newfangled technology, but with neighbors living around them" (Editors, 1996, p. A4).

"So three cheers for an initiative at Highland Park Learning Center…" (Editors, 1996, p. A4).

"The program…has draw national attention. In little more than a year and a half, Computing Seniors spread to 17 schools in Roanoke and was the subject of articles in both Parade Magazine and a national education journal, called Educational Leadership. The city even received calls from schools as far away as California and Florida interested in starting their own classes" (Roanoke City Public Schools, 1997b, p. 3).

c. Benefits to Seniors

PRINCIPALS

1. It makes them feel like they are in touch with current trends. They can be familiar with technology; they are less fearful of it; it enhances their self-esteem.

2. Gain knowledge about how a computer works and functions; have some fun, socialize some.

3. Have learned about basic computer usage; its been a big confidence and

(Appendix continues)

ego booster for them; its changed their attitude about learning.

4. Revalidation of their own ability to learn; feel less threatened by this piece

of machinery; have gained some tools to continue their own learning.

5. Its raised their level of excitement and enthusiasm for learning; they have

developed greater self-confidence; the social interaction and camaraderie.

6. they see the school as a friendly and welcoming place; have developed

new friendships; have fun; enhanced their personal communication with

family and friends through use of technology; kept their brains more active.

7. social benefits; learned that technology is not so hard; makes them feel

more connected to today's high tech world.

8. they feel that they can still learn; learned word processing; enjoy it.

INSTRUCTORS

1. Learn how to use a computer; feel more comfortable with it; better able

to relate to their children and grandchildren.

2. Some have had an attitude change about public education; see our poten-

tial; they see that their tax dollars are going for something useful; Provides an

opportunity to get out of the hose, to keep their minds stimulated; connects

the generations around a common interest; sometimes reconnects family

members.

3. They made some new friends; no longer afraid of the computer; eager to

learn more about technology.

(Appendix continues)

4. Personal satisfaction from learning a new skill; opportunity to socialize;

opportunity to get reconnected to the school

5. Learning the computer skills; enhanced job related skills; feel more confi-

dent with computers.

6. Get a better feel for what technology is doing; gain knowledge of the

internet.

7. Getting back to stretching their brains; social benefits

8. A lot of social interaction; become more literate in the use of computers;

increased confidence and greater independence; many want to purchase

a computer.

9. They feel satisfied with what they accomplished.

10. No response

11. No response

SUPERINTENDENT

It's a boost to the egos and the self-worth of the seniors; they have fun;

STATEMENTS FROM DOCUMENTS

"The class may even help some seniors find part-time jobs thanks to a local

company that does work for the American Association of Retired Persons….The

company…likes to hire part-time workers who are over 50 and computer-

literate" (Roanoke City Public Schools, 1997b, p. 3).

"They're using the Internet to plan vacations, track finances, trace

(Appendix continues)

genealogy, do research, explore ideas, and take classes. Most of all, they want to stay in touch: with family, friends, and the future" (Adams, 1996, p. E1).

"Its also about re-creating a sense of community in neighborhoods and bridging generation gaps. What better way than to open public schools in the evenings and on weekends for multipurpose use by all of a community's citizens" (Editors, 1996, p. A4)?

d. Disadvantages

PRINCIPALS

1. There haven't been any

2. None what-so-ever.

3. Can't meet the demand; some seniors think we are here for permanent help, they think we can help them at any time, they don't understand about what we have to do day in and out.

4. none

5. none

6. none

7. no negatives

8. none

SUPERINTENDENT

Not being able to meet the demand; some seniors might be disappointed.

(Appendix continues)

STATEMENTS FROM DOCUMENTS

No statements were found in document for this area.

Similar Responses to Domain: Innovation and Change

a. How Does Change Occur in Your School?

PRINCIPALS

1. You talk to the people who it is going to directly involve, get their input and talk about it, then second of all to the greater group, and once everyone is in agreement about what should happen, then you implement it.

2. I consider myself not a direct person…I like to bring people on board…you have to bring them along in a gradual way. First, I talk with people and share with them some of the things I would like to see happen and I get their in-put…what would be their approach; I listen to staff members, especially some of the leaders of the school. And in talking to them, I have some general ideas of what I want in the first place and share my ideas and see how they feel. Then we polish the idea together…and get some of the staff members to share how this approach will be more beneficial to the students and to the entire school, and then we move on from that point.

3. No data on change process

4. My knowledge about change is limited – I know change is usually a 3-5 year process; people are resistant to change; it is threatening because you're breaking norms and comfort zones of a lot of people – beyond that, I don't know that much about it.

5. No data on change process

6. With change within our building, we take a look and we present it to the people above us, as being what we would like to do…how we'll go about it. I will present the plan to the superintendent or assistant superintendent…a couple of examples are given. We feel that we can pursue things if we have a good argument for it. I think we have an environment that says try me, try something new. I think the superintendent and assistant superintendent encourage new ideas.

7. No response on change process.

8. No response on change process.

INSTRUCTORS: Were not directly asked to address the process of change.

SUPERINTENDENT

On implementing a change: I think through how to put an idea forward, how do I say to principals [what I want done]…I try to replay in my mind all of the possible reactions I will get and think through how I could respond to any of those reactions so that it will be seen as a positive thing…I think through all of that and say the fact of the matter is that this is something that needs to happen. I think/talk with senior staff about it to get their thinking. What is the best way to introduce this idea and should it be an idea introduced as a requirement, mandate, or a directive or should it be thrown out for those who chose to do it and let it go. [I try to be] clear about the expectation…to hold the expectation that this is what I will be looking for. I would add that in the

(Appendix continues)

change process there should never be any surprises. There should never be a motive to get you. [In] The change process you have to clarify what it is, what is the expected outcome and why it is important to make this shift…recognizing that change is difficult.

Superintendent's comments on INERTIA: I will try to use the information I have to put it on the table and say you are resisting the change. Here's what the data says to me, what does it say to you? [If that doesn't work] because you've already made up your mind…I shift gears and say there is a need to change. If you are not interested in doing it the way that I am suggesting, then come up with something better than you are already doing. If that doesn't get them to move…then I will direct that you do something different and here is what it is. So my first goal is to get people to say they need to change…try to get it to emerge from them [but] either you do it or I will…

Superintendent's comments on ENTROPY: Entropy sometimes….if its truly creative and innovative, it may be heading towards chaos but I've seen it not being chaotic and that's where the risk taking and the bright ideas and the new ideas I think have to be allowed to be played out….I shouldn't always be the one with the answers and always keeping the collision from happening. If I do, others don't develop the leadership skills they need to say we're not going in the right direction. So entropy isn't necessarily bad until you get to where it is total entropy and then you've got a problem.

(Appendix continues)

Superintendent's comments on whether the CS program stimulated new ideas? Yes…possibly open up our media centers for some block of time to the whole community in order for the community to take advantage of the technology that is there, not in a supervised classroom like the computing seniors…simple letting the public come in and use the equipment…what kind of response would we get…I don't know but I would be willing to do that.

STATEMENTS FROM DOCUMENTS

No statements were found in document for this area.

b. Modifications Made to the Program

PRINCIPALS

1. I haven't done anything to it, its been the same since day one.

2. They opened up the program to persons other than just seniors.

3. The program has evolved to include more internet activities; we want to do a computing parents program; it has tweaked our thinking on other ways of involving seniors in our school.

4. Program modifications – none, we've done it the way it was originally designed.

5. We added using student assistants to help conduct the program. These intergenerational connections worked out well for both the young and the old. We changed the program from meeting once a week for 12 weeks to twice a

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week for 6 weeks.

6. We opened up the program to make it "Computing Folks", open to any age group outside the school. We used it (the established program) as a model…not that it was intended to be <u>the</u> program but intended to be a directional indicator for the program; but the heart of the program is the same.

7. We've used some middle school students as assistants in the lab; we increased the length of the program; I would like to have multi-levels of the classes.

8. We've not made any changes to the program. We have had some discussion about what else we could do to involve them [seniors] more. I'm thinking about how we might benefit the community (in other ways).

INSTRUCTORS

1. We added a lesson on how to purchase a computer; we brought in a business person looking to possibly hire some seniors; we reduced the time for socializing; we added a "family show-off day"; we need to do more with personal finance and banking – many seniors are very interested in those areas.

2. We created our own curriculum and materials; we were overly ambitious in the beginning, so we simplified it, brought it down.

3. I modified it some… to better meet the needs of the seniors…but it was pretty much the same.

4. Changes…not really, just adjusted the pace.

5. We had to adapt the curriculum and break it down into smaller incremental steps of instruction. We opened up the program to the community, not just senior citizens.

6. Can't think of anything we did differently

7. We brought in students [to assist with the instruction and to help the seniors]; we probably made some curriculum changes, but beyond that, nothing.

8. no data

9. I taught the initial class, so everything I did was new.

10. no response

11. I got what I needed from [predecessor] and I only made a few changes.

12. I used the original materials as an outline and modified it according to the ability of the group; but generally kept the course the same.

SUPERINTENDENT: was not asked about changes made to the program.

STATEMENTS FROM DOCUMENTS

No statements were found in document for this area.

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VITA

John E. Lensch is currently an instructional supervisor. From August, 1983 through November, 1999, he was the principal of Highland Park Learning Center, an elementary magnet school located in Roanoke, Virginia. Under his leadership the school has been awarded the National Blue Ribbon School of Excellence Award (1992), was designated as a Title I National Distinguished School (1997), and received an Honorable Mention in the National School Boards Association Magna Awards (1998) for the creation of the Computing Seniors Program. Prior to the principalship, he was the supervisor of computer science for the school division, serving in that capacity for about six years.

He earned his Bachelor's of Science Degree from the State University of New York College at New Paltz in 1969, majoring in general science education. After graduation, he enlisted in the U.S. Air Force and was stationed at the Air University, Maxwell Air Force Base in Montgomery, Alabama from January, 1970 through August, 1973, during which time he earned his Master's Degree in Educational Administration and Supervision from Auburn University.

Mr. Lensch has taught science and mathematics in grades six through nine, has been a social worker in the area of community services and social services planning and development, and has created, owned, and operated a small business involved in solar and other forms of alternative energy equipment.

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John E. Lensch

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