

' EDUCATION IN THE YEAR 2035--
A DELPHI STUDY TO IDENTIFY POSSIBLE FUTURES
OF THE PUBLIC SECONDARY SCHOOL'

by

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Educational Administration

(ABSTRACT)

The purpose of this study was to identify projected critical changes in the public secondary school of the future as perceived by a panel of experts. The panel of experts was composed of persons who are leaders in the field of education and futures.

The review of the related literature indicated that there were seven discrete critical areas in which changes were most likely to take place in the public secondary school by the year 2035. These areas were as follows:

1. Fiscal support
2. Curriculum
3. Technology - Administration
4. Technology - Instruction
5. Student Characteristics

6. Personnel - Administrative

7. Personnel - Instructional

The panel of experts was asked to respond to futuristic trends within each of these areas in terms of probability of occurrence, time frame of occurrence and impact on the public secondary school as we know it today.

This study used the Delphi Method and involved a series of three questionnaires. With each round of questionnaires, the responses were refined so that the ultimate goal of consensus could be obtained.

Results indicated that the select panel of experts came to consensus on most of the futuristic trends which were identified. Forecasts were given primarily for time periods within the next fifteen years, and participants seemed reluctant to make long-range predictions.

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CHAPTER 1

INTRODUCTION

What will happen to education in the future? In many respects the future is already here. During the last several years, rapid societal changes have affected many aspects of our lives. A redefinition of traditional family roles and an upsurge in single parent homes present evidence of this change. Global perceptions concerning entry into the information age, rapid development of technology, and changing economic expectations seem especially pertinent.

By looking at today's trends, one can get a glimpse of the future and can, therefore, plan a more accurate future educational base. Technology development is growing exponentially (Lewis, 1983). This development was recently illustrated in Scientific American: "If the aircraft industry had evolved as spectacularly as the computer industry, a Boeing 767 would cost \$500 today, and it would circle this globe in 20 minutes on five gallons of fuel" (Toong & Gupta, 1982, 87).

Therefore, our image of the future does not merely concern acceleration of technological developments, but acceleration itself (Lewis, 1983). The ability to adapt to these changes may well present the major challenges for education in the year 2035.

Recently, quality of education has emerged as a national priority. Even though definitions of quality may vary, it is becoming apparent that more and more careers will require backgrounds in science, math, and computer science. Many skills that may today be considered higher level skills, such as critical thinking, analysis, synthesis, and problem solving, will become absolutely essential for most workers in the future (Lewis, 1983).

Statement of the Problem

Public secondary schools are so busy keeping up with the present, they have a difficult time keeping up with changes, trends, and future directions. But, for public schools to continue to make a valuable contribution to society, involvement in future planning must take place. There is a present need to know those critical future changes that will affect the public secondary schools.

Purpose of the Study

The purpose of this study was to identify projected critical changes in the secondary schools of the future as perceived by a panel of experts. The panel of experts consisted of individuals who were well-respected in their field and had demonstrated knowledge in the area of

educational futures. The goals of this study focused on several research questions:

1. Within the next 50 years what changes relating to the fiscal support, administrative personnel, and instructional personnel are likely to occur in the public secondary schools?
2. Within the next 50 years what curriculum changes and changes in student characteristics are likely to occur?
3. What specific changes in instructional and administrative technology will take place in the next 50 years?
4. What impact will the changes in fiscal support, personnel, characteristics of the student body, curriculum, and technology have on the public secondary school?
5. What is the suitability of using the modified Delphi technique as a tool for forecasting the future of public secondary education?

Significance of the Study

The significance of this study can be found in the opportunity it presents to educators to pinpoint and resolve issues that pertain to public secondary education in the future. It is further hoped that this study will succeed

in the raising the consciousness of educators to the importance of futures forecasting in education. The research findings will most certainly assist educators in assessing the magnitude of future issues and trends as they relate to public secondary schools.

Background and Theoretical Basis for the Study

The future of the public secondary school has been identified as an issue of utmost importance to educators. Some of the basic problems confronting educators have been identified as follows:

1. The changing numbers of students to be educated.
2. The changing ways in which students will be taught or trained.
3. What students will need to know in order to meet the demands of the twenty-first century.

This study involved the promulgation of a possible scenario for the secondary schools of the year 2035, predicted upon the estimates of noted educators and others who have intimate knowledge of social trends and social forecasting. This research somewhat paralleled a 1981 study by Anderson on vocational education and replicated her sampling and experimental design procedures (Anderson, 1981).

Assumptions

There are several basic assumptions of this study. One of the basic assumptions is that the members of the panel of experts were appropriate for participation in the study--and that the procedures used for the selection of the panel of experts were designed and followed appropriately. It must also be assumed that the shared opinions of the experts were indeed their true, frank, and honest opinions regarding the identified components of the study. Another basic assumption of this study was that projections made in this study were made on the basis of events expected to occur in the future. However, it should be pointed out that forecasting is described by many as "an important intellectual activity" (Cornish, 1977, 549). Another assumption was that the Delphi technique, developed by Olaf Helmer and Norman Dalbey of the RAND Corporation, was the most appropriate forecasting instrument for this study (Helmer, 1967). The selection was made because there were a number of advantages to the use of the Delphi technique. Some of those advantages were as follows:

1. Geographical and scheduling restrictions were not a major problem because of the use of this technique.

2. Administration was easy.
3. Cost was relatively low.
4. The technique permitted the researcher to obtain information about complex items that through other techniques might have been difficult to conceptualize.
5. The technique allowed the researcher to have a high degree of control in managing the research instruments and procedures.

There were likewise some disadvantages that were also taken into consideration:

1. Difficulty in communication by mail and phone.
2. Possibility of distortions through the selection of experts.
3. No assurance that consensus would be reached.
4. Difficulty with questionnaire construction.

Definition of Terms

1. Consensus-seeking: Attempt to obtain agreement.
2. Delphi techniques: Research conducted in a systematic way to solicit and aggregate individual opinions or judgements using, in this study, a panel of experts to arrive at consensual views about future events (Cornish, 1977).
3. Divergence of Opinion: Disagreement over ideas.
4. Expert: One who participates by providing data or estimates for use in a Delphi study.
5. Forecast: An organized, logical system used to provide data to be used for decision making or prediction of future trends and needs.
6. Future: "A time that is to come" (Webster, 1979, 464).
7. Futures: "Events or situations that might logically develop" (Cornish, 1977, 258).
8. Skill: "The ability to use one's knowledge effectively and readily in execution or performance" (Webster, 1979, 1079).
9. Trend: "Direction of movement" (Green, Jorgensen, & Gerberich, 1953, 595).
10. Secondary schools" High schools, usually consisting of grades 9-12 or 10-12.

Limitations

Three principal limitations of this study were as follows:

1. The conjectural nature of the study. The results of the study can only be verified by the actual passage of time.

2. The selection of experts, each of whom brings a unique set of perceptual filters to the process.

3. The influence of the "researcher as the interpreting instrument." The researcher, as interpreter of the data, could bring perceptual filters and potential biases to the study.

CHAPTER 2

REVIEW OF RELATED LITERATURE

As the twenty-first century approaches, it is both relevant and necessary to theorize about the state of education in the conceivable future. Society must be conscious of theories and ideas being brought forth today which will focus on long term goals, planning and strategies for the secondary schools of tomorrow. This chapter contains views of educators and others who view the task of educating our youth in the year 2035 as one of critical importance to the continuation of our society. Specifically, these views will focus on the changes in and role of secondary educational institutions in the future. Those areas of critical importance at the secondary school level were identified as follows: fiscal support, curriculum, technology as it relates to administration and instruction, student characteristics and personnel and instructional personnel. This review of related literature is presented in four parts. First, the historical view of secondary schools'; second, the current view of secondary schools; third, the future trends in society and future trends in secondary education; and fourth, an explanation of the information gathering mechanism for this study, the Delphi Technique.

Historical View of Public
Secondary Education

In an effort to center this discussion on recent history, public secondary education will be examined from the mid 1950's to the present. In a historical sense, this period is significant because of the parallels which can be drawn. First, the launching of Sputnik in 1957 startled and alarmed the U.S., thus providing the impetus for a new awareness regarding the importance of and a commitment to our public secondary institutions. This commitment was sweeping in scope, calling on state and local support as well as an increased federal role to help American education prepare young people to contribute their best to future progress in the nation (Boyer, 1983). Today, those same public secondary institutions find themselves under attack again in the 80's. Adjustments and reforms must be made to insure that the youth of our society are equipped to make the decisions required of them in the vastly complicated, exponentially expanding, high-technology/information world in which we live. The phenomenon of criticizing the public secondary schools stems from and is a partial result of a "paradigm shift", which dictates that the secondary schools adjust to provide the skills necessary to survive and prosper in

the world of tomorrow (Niebuhr, 1981). The focus of the reform in 1957, as well as today, was and is to access the skills and abilities of the individual to provide for the overall well-being of the entire nation. The whole is only as great as the sum of its parts.

With the launching of Sputnik, American education was given its first great challenge of the modern world. The fear of falling behind other nations in the world, especially the Soviets, was highly unappealing. Deficiencies in science and math education were problems which could lead to the U.S. losing its competitive advantages (Pottenger, 1983). As mentioned previously, a team effort was created to address these shortcomings in American public secondary education. Programs were developed under the auspices of the National Science Foundation to help develop students in the sciences, and at the same time to upgrade quality in teaching (Pottenger, 1983). The result of this renewed emphasis on structure within education was the increased number of students entering scientific and technical fields in the 1960's and early 1970's. Yet the question remains, why didn't this renewal of emphasis sustain itself into the mid 1970's and 1980's? Robert Henderson offers the explanation that the Vietnam experience had a significant influence on the squelching of science and engineering studies in

this country (Henderson, 1983). Technology of the period was defense oriented, thus associated with the war in Southeast Asia. Therefore, the assertion was made that since the war was unacceptable, technology was also. "There has been a constant erosion of quality of students entering the sciences since the late 60's" (Pottenger, 1983, 24).

In reaction to the anti-establishment protest movement of the late 60's and early 70's, public secondary schools seemed at a loss for a positive direction to take. Some argued that recent technological advancements, such as Three Mile Island, Skylab, and the DC-10 were failures reflecting negatively upon science education in particular and education in general (Markert, 1984). Others saw the 70's as a transitional period which introduced student choice to secondary institutions. Student oriented elective curriculums reflect this trend (Bamberg, 1981). Emphasis on "survival skills" rather than on teaching better communication skills tended to dilute reading curriculums to their lowest common denominator (Hettinger, 1983).

Further, a comparison of the quality of students in the seventies compared to that of the sixties revealed that Scholastic Aptitude Test (SAT) scores had been on the decline for more than a decade (Henderson, 1983).

Niebaker suggests that this could be a result of the difficulty schools have in teaching problem solving (Niebahr, 1981). He further states that problem solving should confront real situations to be most effective (Niebuhr, 1981).

It seems that the 1970's was a decade of indecision regarding one of the most important commodities within our society--the minds of the adolescent. This indecision must, in part, be responsible for the "rising tide of mediocrity" in our nation's schools.

Current Views of Public Secondary Education

Once again, as was true in the late 1950's, public secondary education has reached a crisis point or crossroads regarding the direction it should take for the future. The training to familiarize students with the technologies and skills of tomorrow is a task mandated to secondary education today. If we fail in this task, the U.S. is likely to become a second rate economic and political power (Levin, 1983). Reports by the National Commission on Excellence in Education and other groups stress a "back to basics" theme. The approach is designed to prepare the young for the complex, instant decision world in which we live. There are signs of progress. California, Ohio, and Texas, among other states, are upgrading curricula and establishing core

subject areas (Henderson, 1983). States are willing to impose higher standards for graduating students in order to insure basic skill levels.

Reform and restructuring of the secondary schools is taking place all over the country. People have realized that complacency breeds stagnation and decay. By standing still in the field of education, one can only fall behind. The individual as well as the country loses its competitive edge. Effectiveness in the classroom, by students and teachers alike is being advocated. The family is still an important aspect in the development of our young people, but this should in no way absolve educators of their responsibility to be instructionally effective (McCleary, 1983).

There are also other considerations in education in the 1980's. These considerations revolve around declining enrollments and population shifts. With enrollments dropping due to a decline in birth rates, administrators have the added burden of solving the problems of excess space due to that expansion in previous years necessary to accommodate students. As if curriculum decisions and related matters are not difficult enough to solve in a smooth transition, one must also realize the reality of financial constraints. These circumstances can lead to some hard decisions regarding instructional

scope within the secondary school. During the past few decades school curricula have expanded, making some programs difficult to support in the short run (Deal, 1983). However, others have shown remarkable ingenuity in proposing solutions to space allocation considerations and program cutbacks due to declining enrollment and demographic shifts (Gores, 1976).

Currently, the promise of computer technology and its applications offers much toward reviving the hope of secondary school educators. A fundamental factor in the attractiveness of the computer is that it can make learning an active, rather than a passive, process (Bork, 1984). Of course, the computer cannot be viewed as a cure all for our educational woes. However, it can and will be an important tool for developing the skills of students. High technology is looked to as the wave of the future for two reasons. First, it is likely that a high proportion of job growth will be found in high technology occupations; and second, these new technologies will be applied to existing jobs (Levin, 1983).

Future Societal Trends

What does the future hold? This vast unknown is both exciting and frightening. World political struggles

will continue and it is likely that such confrontations will take place between industrialized and nonindustrialized nations, with technology at the forefront of disagreements. A new economic order could burst on the scene (Shane, 1981). The average age of the U.S. population will increase as the baby boom generation grows older, thus shifting the majority of the population into elderly groups. What strains will this demographic shift place on social institutions in the U.S.? Are we moving toward a jobless, leisure society, as some suggest (Jennings, 1982)? How does society deal with a workforce that is increasingly white collar in nature (Jennings, 1982)? There are a number of future societal trends that will affect the public schools in the 21st century:

- o Public schools will retrain workers making career changes, perhaps 3 or 4 times during their working lives, due to high-tech.
- o Minority populations will become the majority in most grade schools in the nation's large and middle-sized school districts.
- o Computers will be available to students in prosperous districts on a 1:4 ratio.
- o Federal grants will provide a major portion of the funding for job training and equipment (including computers) in poor school districts.

- o Total employment will rise by 17 percent to 25 percent as the workweek declines to 32 hours (1990) and then 20-25 hours (2000).
- o Women, particularly married women, will enter the work force at a faster rate than any other group within the population.
- o More businesses will be involved in apprenticeship training.
- o Older citizens (over 55) increasingly will participate in public school programs.
- o A core, 9-month program will be offered in elementary and high schools, shifting electives to later in the lengthened day and to summer sessions. (Cetron, 1985, 14).

What is clear is that education will be looked to increasingly in the years ahead to provide the basic skills and abilities necessary to solve these and other crucial problems in the coming half century. The skills associated with problem solving will be in high demand in the coming years.

Overview of the Public
Secondary School of the Future

The organizational structure of public secondary schools is a vital contribution to the success of the

institution, and also provides insights into possible failures. Of course, there is no absolutely fool-proof method of structuring organizations for success. However, with rapidly changing numbers of the available school age children in the U. S., public secondary schools may have to look closely at organizational structures and how they can be reorganized for maximum effectiveness. David Larson has stated that, "the organization that lacks vision will collapse" (Larson, 1983, 10). If this is fact, we must ensure the perseverance of the public secondary schools through adaptive organizational flexibility. Gores views secondary schools as a "principal instrument for providing the social cement that holds us together" (Gores, 1976, 95).

Further, the strength of the American public school system is enhanced through maintenance of local control and autonomy, rather than through imposition of a centralized Federal system. This history of local control has been reinforced by recommendations in the report "A Nation at Risk," (1983) which encourages States to take the lead role in development of curricular requirements, thus dictating to a certain extent, organizational structure. Maddock in his comparison of English, Australian, and North American structures, attributes the term "track" to the North American experience (Maddock, 1983). He goes on to suggest that the "track" structure influences

curriculum by dividing students between academic and technical contexts (Maddock, 1983).

Organizational change seems imperative as funding cutbacks are made and enrollments decline in many areas of the country. This poses difficult situations for those entities which make decisions. Hard economic times dictate a "back to basics" instructional program without so called "frills" courses (Deal, 1983). The long range enrollment decline cited earlier is noticeable in metropolitan areas, especially New York City (Gores, 1976). This presents new challenges with regard to unused space. Problems can occur if one lacks imaginative solutions to these space burdens (Gores, 1976). Long range criteria should be the basis for organizational decisions (Deal, 1983).

It is obvious that a focal point is necessary in deciding the type of organizational structure for a given school district. Organization must take into account the whole of the institution, including curricula, administration, societal needs, etc. and must be future oriented to be ultimately successful.

From 1970-1977, Harold Shane authored three major studies on educational futures. These three studies focused on future educational trends, the relationship between future studies and planning, and implications

for curriculum, instruction, and goals.

One of the studies was entitled "What Will Schools Become?" In this study educators were surveyed to determine educational trends between 1975 - 2000. Some of the trends identified in this study had already come to prominence by the mid 80's. These include:

1. Re-examination of teacher training.
2. The voucher issue.
3. Sex education (Shane & Nelson, 1971).

In 1971, Dr. Shane prepared a report for the United States Office of Education. The following questions were addressed in that report:

1. What is the state of the art of futures planning and futures studies in policy research centers, and to what extent is the work underway of relevance to U.S. public education?
2. How can the educational community, particularly the USOE, best make use of policy and futures research?
3. How can the USOE use to better advantage the two policy research centers at Stanford and Syracuse Universities?
(Shane, 1971, 13).

In this study, futurists surveyed indicated that American education suffers from a lack of consensus about which educational goals should be emphasized. Shane concluded that sweeping changes would not occur in the near future. Changes in educational goals, subject matter, and structure would take time. In the conclusion of this study Shane described the futurists who participated in his study:

The typical futures research person emerged as an "idealist in the sense of seeking curriculum content for better alternative futures and as a "realist" in the sense that he saw continued need to maintain many long-established educational values, firm rather than harsh intellectual discipline, fair but not unreasonable standards for individual accomplishment, and need for mastery of substantive content on the part of those whose contributions to society would thereby be increased. (Shane, 1971, 114).

Administrative Personnel

The challenges of the 21st century are no less extreme for administrators than for any other group in secondary

education, and probably more so. Administrators must "develop a clear vision of present and future needs" (Deal, 1983, 488). This is difficult in that this group of people is expected to project possible future pitfalls, which leaves vast opportunity for after-the-fact criticisms. Deal outlines three approaches to administering the public secondary school described as the national, political, and symbolic approaches (Deal, 1983).

Scenario developers such as Christopher Dede try to anticipate outside influences on educational institutions. Examples of change include flex-time scheduling of work forces, work sharing programs, and a myriad of other technological innovations which will modify our lives (Dede, 1981). These are the types of future conceptualizations with which administrators will have to deal in making choices regarding programs and directions within their schools. The reemergence of quality education in the urban setting is an example of the effect strong disciplined leadership can have on improvement (Ruffin, 1983).

Effective administrators must have the ability to facilitate a large variety of community positions. They must be realistic and discard goals that cannot be achieved (Iannacone, 1984). This does not always place the administrator in a favorable light. Demographic information can be an important tool in analysis of population trends

and movements between regions and should be used by administrative personnel to forecast future trends. Joseph Coates has done significant work on population trends with regard to educational planning (Jennings, 1982). School authorities will be required to provide more education for less money (Jennings, 1982). Thus, financial problems are the number one concern for administrators. How to get more out of less is increasingly difficult and could lead to the requirement for very unpopular decisions in the short term.

Instructional Personnel, Instructional
and Administrative Technology

Could the traditional method of classroom lecturing soon become obsolete? Students, with the aid of computer based libraries, could study at home (Shostak, 1981). Marvin Cetron believes that students will learn at home or in their communities one or two days a week (Cetron, 1985).

The microcomputer could revolutionize the need for centralized schools and the need for teachers as we know them today. Others feel that the methodology in teaching will emphasize creativity rather than knowledge or the action of knowing (Larson, 1983). Teachers will be given teaching assignments based on the kind of teaching they do best (Cetron, 1985). Teacher pay and performance will be raised and teachers will work more in community

businesses as part of their job responsibility. Frequent review of performance and internships by teachers will be instituted by 1990 (Cetron, 1985). Time constraints will be of little concern as students will be able to draw upon incredible resources at anytime (Larson, 1983). This type of education has shortcomings in that those who are have-nots could fall further and further behind in taking personal advantage of technological advances (Shostak, 1981). Thus, a wider intellectual rift could develop within our educational institutions.

Advancements in technology could lead to a larger capacity on the part of the schools to handle diverse student needs. These thoughts on instruction tend to suggest that students will be placed in an instantaneously responding environment. A student would require only a home computer and data base for learning to take place--almost as if by osmosis. The social aspect of the present day secondary school is sadly lacking in many of the future scenarios discussed here. Others see effective problem solving in social situations, confronting real rather than artificial problems, as most useful (Niebuhr, 1981). Further, Niebuhr does not see the world of educational instruction as black and white. Should we have education for adjustment or education for intellect? He rejects

both premises on the basis that we should not have to choose between "smart psychotics or well-adjusted dopes" (Niebuhr, 1981, 370).

Still, advanced technology will be massively employed in the near future. It is the responsibility of the schools to head off a "computer literacy crisis" which could slow down the learning process for large numbers of students. Kitch has referred to computer literacy as the "fourth basic intellectual skill" (Markert, 1984, 30). Dillon and Wright have compiled futures scenarios which emphasize the development of diagnostic instruments for determining students' shortcomings (Jennings, 1982). It seems that high-technology will be in the forefront with regard to change in instructional technique. A major challenge for educators will continue to be production of effective educational materials and courseware that take advantage of newly developed technology and software. Technological advances will alter learning opportunities and create new and imaginative learning environments. With rapid development taking place in these areas, instructional personnel will need to be flexible in dealing with such technological advancements.

Curriculum

Curriculum development and scope depends on the focus which the school takes with regard to future problems and trends. Larson (1983), Shane (1981 b), and Hawley (1984), all tend to agree that the unpredictability of the future necessitates a wide range of skills and problem solving techniques. For this, the student of the future will have to develop interdisciplinary or cross-disciplinary linkages (Shane, 1981 b). Concurrently, Larson states that the "compartmental design" for curriculum is outmoded (1983).

Do traditional subject areas and disciplines have a place in the curriculum of tomorrow at the secondary level? Hawley (1984), Hettinger (1983), and Kenney (1981) all feel that the traditional back-to-basics approach should be employed and that emphasis on communication skills should be stressed. Betty Bamberg also sees the secondary English curriculum as an important tool in measuring academic progress. She incorporated a study done at UCLA into her theories on the importance of the English curriculum in secondary education (1981).

A study by Shane entitled Curriculum Change Toward the 21st Century concerned curriculum guidance in anticipation of conditions to be expected in the 21st century. This study reported a wide spectrum of information about

education that could be of great value in developing and planning curriculum for the next century. But Shane (1977) cautioned that in order for this material to truly be effective, it must be a part of the planning process for curriculum development.

It is important to note that, although the curriculum described previously is basically traditional, the future could change that curriculum drastically with the advent of high technology. The term "technological literacy" is important in understanding what changes the curriculum of the future could bring (Markert, 1984). Science and technology education are necessary for today's youth if the U.S. is to keep its competitive edge (Markert, 1984). Shane sees an interest in the sciences as necessary for a different reason. The reasons cited by Shane revolve around the role of man as a "change agent" in his own environment (Shane, 1981 b).

Overall, the back-to-basics approach, including an emphasis on high technology and math and science instruction seems to be the wave of the future. However, it must be pointed out that equal weight is given to the English curriculum in developing students who are able not only to use the skills learned from high-tech experiences, but who can also communicate effectively.

Student Characteristics

Identifying what specific needs students and society will have in the future is important to any learning institution. However, this relationship will be crucial in setting priorities for the education field. Dragseth, in his Delphi Study, concluded that in the future, "many secondary students will attend school on a part-time basis" (Dragseth, 1982, 368). If this is true, the scheduling of classes for students could become increasingly flexible. Also, if students attend class on a part-time basis, we may assume that cooperative work programs will be an important aspect of the educational experience. Future students could have equal experience in the classroom and in the workplace. Further, it is highly probable that the student of the 21st century will be quite familiar with high-tech innovations such as personal computers and advanced software and how to apply these technologies on a day-to-day basis. Thus, research skills and the ability to obtain access to information could be mandatory survival skills (Larson, 1983). Markert agrees saying that these devices, "may become tools in the hands of the powerful and affluent to emphasize and exploit the disadvantages of the 'computer illiterates'" (Markert, 1984). Taken in this context, students of the future will have to characteristically

conform to the information society which is being thrust upon them.

The quality of basic skills such as writing could be on the rise. Bamberg cites a study at UCLA which concluded that an overall improvement in scores on English usage and writing skills tests occurred during a recent five year time span (Bamburg, 1981). However, others feel that the students of the future will lack the ability to think critically and express themselves openly (Kenney, 1981). Kenney also states that there, "is a rising attitude on the part of parents and some administrators that enrichment materials are frills" (Kenney, 1981, 232). Further due to the increased emphasis on basic education, it is likely that students will receive a broader science background (Henderson, 1983). Thus we can conclude that the "new breed" of student will have superior aptitude in science related fields.

It is quite possible that high technology will change the structure of both the secondary school and the students who frequent the institution. Students could be taught at home through the use of video screen and tapes or by electronic lessons. This could stratify the student body, decentralize the school of today, and make the student more independent or isolated. School work may take place in the home but the student could lose some of the learning experience that a group social setting provides through

common student experiences (Cetron, 1985). Still, the key is the motivation of the student, and if learning takes place at home, a question remains concerning whether or not the student will have the drive and inner resolve to study or to train for a job. These are questions which can only be answered through the passage of time. The one skill absolutely essential for the student of the future is the competence to meet change--especially technological change--with confidence and flexibility (Houston, 1983).

Fiscal Support

The all-important role of funding of the public secondary schools is vital to the well being of these institutions as a whole. As more and more schools come to grips with the changing demographics of the U.S., innovative means of financial support may need to be explored. It is accepted that the local school is tightly woven into the fabric of the local community. As declining enrollments continue in some parts of the country, questions are raised concerning appropriate action. For school administrators and school boards, it means that a potential for conflict is just over the horizon, which will be complicated by myriad decisions.

Recent predictive research by the Danforth Foundation and the National Academy of School Executives printed the

following findings:

1. The competition between the school and other governmental agencies for funds for the more adequate support of services will become more intense.
2. How to provide more education for less money is a problem which will concern school authorities.
3. Control of schools by state governments will increase, especially in the matters of finance, curriculum, school buildings, and teacher welfare. The state will pay an increasingly large part of the expenses of the school.
4. All expenditures for public education will be viewed with strong suspicion by taxpayers. (Jennings & Cornish, 1982, 102).

In many states votes on school millages are among those matters most susceptible to public control. Local residents have the power to grant or to refuse funds through the ballot. In poor economic times, negative votes are often cast. This can hurt the community in the long run.

However, there are many options available to school administrators who feel the need to exercise more control in funding for schools. One of the more popular trends

in urban school districts relates to strong school/business relationships (Ruffin, 1983). Thus, businesses in the local area are encouraged to become involved, as business stands to gain a reserve of skilled and trainable youths through its involvement in local schools (Ruffin, 1983). Further, declining enrollment can be either a resurgent problem or an exciting challenge for those in decision making positions. Unused space can be used to finance other programs or leased or sold to entrepreneurs (Gores, 1976). Financial help can also come in the form of federal grants or through funds from private foundations such as the Mott Foundation, the Merrimack Education Center, and the Rockefeller Family Fund (Gores, 1976).

The most positive prospect for the future could well lie in the interest of private sector organizations in allying themselves with education in order to produce bright and intelligent graduates. This could help subsidize the public secondary schools, and through a combination of tax dollars and business contributions schools could both survive and prosper to a greater extent than would otherwise be possible.

History of the Delphi Technique

The site of the most revered order in ancient Greece is known as Delphi. Legend has it that the Greek god Apollo

made himself the Master of Delphi. This site became an oracular center and a sort of art museum. Apollo was known for his ability to forecast the future and his forecasts were supposed to be transmitted through intermediaries and interpreted by priests (Morey, 1902).

In the 1950's Dalkey & Helmer of the RAND Corporation chose the name Delphi for that procedure designed to "obtain the most reliable consensus of a group of experts....by a series of intensive questionnaires interspersed with controlled opinion feedback." In the initial endeavor the application of "Expert opinion to the selection, from the point of view of a Soviet strategic planner, of an optimal U.S. industrial target system and to the estimation of the number of A-bombs required to reduce the munitions output by a prescribed amount" was of particular interest (Dalkey, 1967, 11).

This work was not made public because of the sensitive nature of the study. However, another Delphi study by Gordon and Helmer, "Report on a Long-Range Forecasting Study appeared as a RAND paper and was widely circulated.

There was growing interest in technological forecasting in the mid-sixties. The Delphi Techniques as developed by RAND found its way into industry, government, and eventually to academe. Simultaneously it has expanded beyond technological forecasting. Linstone and Turoff defined Delphi as follows: "Delphi may be characterized as

a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem." (Linestone and Turoff, 1975).

One of the earliest uses of the Delphi Technique in educational research was a study performed by Helmer as part of a 1965 Kettering project. The purpose of that study was to compile a list of preferred goals for possible federal funding (Helmer, 1967).

Many other Delphi experiments that had a direct bearing upon education have followed this initial study. Some of those are cited as follows:

The Delphi Technique has been used to assess knowledge and skills that will be needed in the future by the adult educator (Rossman and Bunning, 1978). Cyphert and Gant used the Delphi Technique to determine opinions concerning teacher education at the University of Virginia (Comer, 1982). Another recent Delphi study involved an assessment of affirmative action programs (Fry, 1980).

Analysis of the Delphi Technique

The Delphi technique is a judgement collection device which allows the questioner the freedom to contact individuals from a wide range of backgrounds with the hope of focusing on a general consensus upon completion of

the exercise.

The Delphi method is but one of a group of techniques used for futures analysis. Other futuristic models originally developed from systems theory were: scenario writing, cross impact analysis, simulation gaming, relevance trees, force analysis, contextual mapping, decision matrix, Markov Chain, Monte Carlo technique, morphological analysis, and others. All of these techniques have become commonplace in futures research (Lindquist, 1973).

The Delphi technique was developed by Dalbey and Helmer of the RAND Corporation in the 1950's. The technique, as classically defined by Helmer, substitutes for face-to-face group activity "a carefully designed program of sequential individual interrogations (best conducted by questionnaires) interspersed with information and opinion feedback" (Rasp, 1973, 29). The Delphi method allows each participant to respond in an individual manner but still permits flexibility and allows the individual to function as part of a consensus group.

The Delphi Technique can be compared to a series of individual conferences, conducted in writing, possessing these characteristics:

1. Each participant is asked to contribute at each step of the process without seeing what other participants have contributed at that step of the process.

2. Input of others is anonymous.
3. Input from one step of the process is shared with all participants as part of the next step. (Helmer, 1967).

The technique involves polling a pre-selected panel of experts on a particular topic and forecasting probable dates of occurrence, probability of occurrence of events, and impact on the present status of the topic under study. The method avoids a face-to-face meeting of participants (experts) which may not be possible to arrange. Delphi provides a methodology for sharing and organizing "expert" forecasts about the future.

The Delphi Technique uses a panel of experts who remain unknown to each other throughout the study. This prevents the influence of one's position or prestige from being a determining influence in the formation of consensus. One assumption in the use of this technique is that one single expert may make an error in judgement, but that a group of experts will collectively reach a reasonable consensus (Rescher, 1969).

The Delphi Technique generally uses a series of either three or four questionnaires. In the first questionnaire the respondent is asked to provide initial input on the specific topic being investigated. From the first round responses a second questionnaire is developed. In the

second questionnaire each panel member is asked to respond to each futuristic trend in terms of likelihood of occurrence, time estimate of occurrence, and potential impact. The third questionnaire provides the respondent with an average of the second round responses for each item. On the third round (third questionnaire) the expert is asked to reconsider his own second round response in light of the responses of his fellow respondents. The final mailing provides an analysis of the opinions and sometimes asks for a final revision of responses.

The Delphi Technique is used to assist a panel of experts at arriving at a consensus of events, probable dates of occurrence, and impact through a series of questionnaires. Consensus, according to Bender is defined as "agreement among at least 60 percent of the respondents that the event had a 50 percent or 90 percent probability of occurring within any ten year period" (Bender, 1969, 289). Lindquist indicates that the result of any Delphi study represents "not the product of any one mind as determined by the influence of any one person, but rather it reflects consensus or lack of consensus in a more objective sense" (Lindquist, 1973, 22).

Several individuals have criticized the Delphi Technique both from the validity and reliability of the research (Sackman, 1978; Hilland Fowles, 1975; and Linstone, 1978).

However the Delphi Technique is still widely used.

Advantages and Disadvantages
of the Delphi Technique

Disadvantages in using the technique for futures scenarios stem from two concerns. First, it is quite possible that the panel of experts may not reach a consensus on the issues presented, thus providing only fragmented information. Secondly, since the opinions and scenarios deal with a long term future plan, the concepts and ideas raised can only be proven or disproven through the passage of time.

Advantages to this method of information gathering outweigh disadvantages in the following ways:

1. Large groups of people can be contacted without the added burden of arranging for a physical meeting.
2. More than one expert can be contacted, thus providing for a wider range of opinion.
3. Group dynamics do not play a part in the sense that personal position, reputation, or force of personality do not play roles in altering others' opinions.
4. The technique allows for equal participation by all participants. Each opinion or comment

carries the same weight as any other.

Overall, the Delphi technique was determined to be the best forecasting method for gathering information about the complex topic of public secondary education in the future.

CHAPTER 3

METHODS AND PROCEDURES

The purpose of this chapter was to identify the population of the study and to describe the measurement instrument and methods used in data collection. Summaries of the procedures used in analyzing these data are also provided in this chapter.

Sample and Population

The Delphi Technique uses a single panel of experts composed of individuals who have expertise in the investigative area. The panel may be either a homogeneous group or a heterogeneous group depending on the members' area of interest (Helmer, 1967). The panel of consultants are persons from a predetermined population sample who agree to participate in the study (Weaver, 1970).

The panel for this study was drawn from a list of 73 names of educational leaders and futurists. The eighteen selected to participate were well-known for their knowledge or writing in the field of the future of the secondary school or the future of society in general. Of the eighteen who were invited to participate sixteen accepted the initial invitation. The panel of experts is listed in Appendix E.

The select panel of experts consisted of a former Secretary of Education, a former teacher of the year, a former senator and astronaut, a former state commissioner of education, authors, current practitioners in educational arenas, and several executive directors of educational associations.

The following definition was used to determine whether an individual was an "expert."

"An expert is one who has acquired special skill in or knowledge of a particular subject" (Webster, 1966, 462).

The judgements and predictions for this Delphi method were based upon "expert opinion." The following definition was used in this research to determine "expert opinion."

Expert opinion is a belief or judgement that rests upon grounds insufficient to produce certainty, but which has been issued by a person or persons possessed of extraordinary skill or knowledge in some particular field (Lindquist, 1973, 58).

Questionnaire Construction

This study utilized three questionnaires. The first questionnaire was open-ended but the other two were scaled. A review of the literature revealed several specific areas

of consideration concerning the future of the public secondary school. Seven areas formed the basis for the first questionnaire.

Data-Gathering Procedures

This study, using the Delphi method, involved a series of three rounds, each of which required the respondent to identify, clarify, and redefine specific areas relating to the public secondary school of the future. Table 38 presents the data gathering schedule and the response rate for each round of the study.

Each panel member was contacted by phone and asked to participate in the study. Then materials were sent to each panel member including a cover letter, instruction sheet, questionnaire, and self-addressed stamped envelope. The initial letter (Appendix A) gave a brief overview of the study and a general outline of the time involved in participating in the study. Accompanying the initial letter and questionnaire was a reply memo which the respondent was to return indicating their commitment to participate in the study. Each panel member also indicated his or her choice of responding by phone or by mail. Eight of the participants chose to respond by mail and eight by phone.

All sixteen people responded to the initial letter

either by phone or by mail indicating their commitment to participate and giving answers to the first round questionnaire.

In the Round 1 Questionnaire participants were asked to respond to seven potentially critical areas in which changes could take place in the public secondary school by the year 2035. These areas were as follows:

1. Fiscal support
2. Curriculum
3. Technology - Administration
4. Technology - Instruction
5. Student Characteristics
6. Personnel - Administrative
7. Personnel - Instructional

Respondents gave open-ended replies recounting their own opinions concerning major changes that would occur by the year 2035 in the seven areas described above. After the responses to Round 1 had been returned or received by phone, the answers were tabulated and the Round 2 Questionnaire was constructed from the Round 1 responses.

Statements of opinion from Questionnaire 1 were classified into possible futures for the public secondary school.

In Questionnaire 2 participants were given the opportunity to react to 39 classified statements of their

own and of other participants and to see their own ideas in relation to those of their peers. Respondents were asked to react to each futuristic trend in terms of probability of occurrence, time frame of occurrence and impact. Respondents were asked to consider their responses and to mark their answers in the following manner:

Probability

- A - almost certain to occur, 90 percent chance
or greater
- H - high probability of occurrence, 60-89 percent
- E - an even chance of occurring or not occurring,
40-50 percent
- L - low probability of occurrence, 10-39 percent
- N - almost no likelihood of occurrence, 9 percent
chance or less

Time Frame

- 1985 - 2000
- 2001 - 2020
- 2020 - 2035
- 2035+

Impact

- +3 - a very strong positive impact
- +2 - a strong positive impact
- +1 - a mild positive impact
- 0 - no impact, either positive or negative

- 1 - a mild negative impact
- 2 - a strong negative impact
- 3 - a very strong negative impact

After the responses to Round 1 Questionnaire had been returned, the answers were tabulated and mean scores for each item were calculated. Each respondent was then mailed a summary of Round 2 results as a part of the Round 3 Questionnaire.

A cover letter and instruction sheet accompanied the Round 3 Questionnaire. The Round 3 Questionnaire was marked with the respondent's answers to Round 2 and the total group's average response. Respondents were asked to review these responses and change any of their responses they wished to change on the Round 3 Questionnaire in the "new rating" response column.

After the responses to the Round 3 Questionnaire had been returned, the answers were tabulated and mean scores for each item were calculated.

Data Analysis Procedures

Eighteen experts were invited to participate in this study. Of the eighteen who were invited to participate, sixteen accepted.

The mean response was calculated for each of the 39 items on Questionnaire 2 and Questionnaire 3.

CHAPTER 4

RESULTS

The purpose of this study was to determine possible futures for the public school in the year 2035 and beyond. A modified Delphi technique was used with a selected panel of experts. This select panel of experts was asked to participate in three rounds of a modified Delphi survey in order to develop some prognosis on the characteristics of the public secondary school of the future.

Round 1

The first mailing (Appendix A) was sent to 18 possible participants. They were asked to give their opinion concerning changes for each of seven identified components of the public secondary school. Those seven areas included the following: fiscal support, curriculum, technology--administration, technology--instruction, student characteristics, personnel--administrative, personnel--instructional. They were also asked to give their opinion on what impact all the changes they discussed would have on the public secondary school. Two of the possible participants notified the researcher that they would not be available to participate in the study. The statements of opinion from the 16 experts participating in Round 1 were

summarized, edited, and synthesized into a questionnaire for Round 2.

Round 2

In Round 2, each panel member was asked to read each statement concerning a futuristic trend, estimate how likely it was that the change would occur, estimate the year the change would be most likely to occur by using the intervals provided, and indicate the impact of the change on the public secondary school as we know it today. Round 2 returns were tabulated and a mean was calculated for each item within each of the three categories--probability, timeframe, and impact. Round 3 was prepared by giving the average group response for each of the 39 items for each of the three categories. These were provided to the panelists, who were also given their own Round 2 responses for each of the 39 items.

Round 3

Each panel member was instructed to compare his/her own response to Round 2 with the average group response. Panel members were told that they could hold to their original response, but that consensus was the objective. The mean was calculated for Round 3 to determine if consensus had been reached. The data were analyzed, the findings of the study were tabulated, and the results were

mailed to the select panel of experts.

Findings

Tables 1-7 show the number of experts who responded by category concerning the probability of each futuristic trend for Round 3. Tables 8-14 show the responses of the panel of experts concerning the timeframe for each futuristic trend. Tables 15-21 show the panel of expert responses concerning the impact of each of the futuristic trends. Tables 22-28 show the mean responses for Round 2 and Round 3 for each futuristic trend within the categories of probability, timeframe, and impact. Tables 29-35 contain the futuristic trends given the highest probability of occurrence. Table 36 indicates the futuristic trends given the lowest probability of occurrence. Table 37 displays futuristic trends in which no consensus was reached. Table 38 shows the data gathering schedule and questionnaire response rate.

Probability - Tables 1 - 7

In Tables 1 - 7 the number of panel members responding was indicated for each of the 39 futuristic trends within the category of probability, timeframe, and impact. The number of select panel members responding was presented for each interval of probability (A, H, E, L, N) for all 39 items on the survey. The items were grouped for presentation purposes under the same major headings in which the

study was conducted. On item number 1, for example, under fiscal support, five select panel members chose A, seven selected H, three chose E, and one chose L.

Timeframe - Tables 8 - 14

The number of select panel members responding for each interval of years (within the four categories provided for in the direction) is displayed for all 39 items in the survey instrument. For presentation purposes, the items were grouped under the same major headings in which the study was conducted. For example, under the curriculum category for item number one, thirteen panel members estimated that the futuristic trend of greater emphasis on foreign language competency would occur between 1985-2000 while three panel members felt the trend would take place between 2001-2020.

Impact - Tables 15 - 21

The number of select panel members responding was again presented for each interval on the impact scale. This scale represents the impact that the respondent felt the futuristic trend would have on the public secondary school as we know it today. The items were grouped for presentation purposes under the same major headings in which the study was conducted. Under the heading of student characteristics, for

example, item number seven indicated that one panel member selected +3 (a very strong positive impact), three panel members selected 0 (no impact), five selected -2 (a strong negative impact), and seven selected -3 (a very strong negative impact).

Mean Responses - Tables 22 - 28

Means were calculated for each futuristic trend by treating the data as interval data and calculating a weighted average. Within the area of fiscal support, the means between Round 2 and Round 3 varied in only one response--question number four, impact. No variation was found in the curriculum area, the technology administration area, or the personnel administration area between Round 2 and Round 3 means. Within the student characteristics area, only one variation was found--question number six in the impact category. The technology instruction area containly only one variation between Round 2 and Round 3 means--question number six, impact. The personnel instructional area contained one change from Round 2 to Round 3 means--question number five, probability.

Highest Probability of Occurrence - Tables 29 - 35

The trends forecasted by probability, date of occurrence, and impact were summarized in these tables in order

Table 1

Distribution of Probable Date of Occurrence Forecasts

Fiscal Support	A	H	E	L	N	No Answer
Greater private sector support	5	7	3	1		
Greater state aid	4	10	1		1	
Less federal aid	1	6	4	5		
Less funding from property tax		7	3	5	1	
More direct voucher funding	3	4	3	3	3	

Table 2

Distribution of Probable Date of Occurrence Forecasts

Curriculum	A	H	E	L	N	No Answer
More foreign language	3	11	2			
More communication skills	5	11				
More humanities and liberal arts	3	5	8			
More basic skills	5	9		2		
More computer skills	14	2				
More performance competency	3	10	3			
Less formal curriculum	1		4	7	4	
Less formal school setting	2	4	2	5	3	
More home based instruction	1	4	4	7		
More self-directed learning	5	10	1			

Table 3

Distribution of Probable Date of Occurrence

Student Characteristics	A	H	E	L	N	No Answer
Same age		9	3	3	1	
Greater learning capacity	3	10	2		1	
More chemical enhancements	2	4	3	6	1	
Less restrictive age groupings	11	5				
More emotionally mature	2	7	6	1		
More job oriented	6	6	2	2		
No student body	1			7	8	

Table 4

Distribution of Probable Date of Occurrence Forecasts

Technology Administration	A	H	E	L	N	No Answer
More use of computers for administrators	16					
More use of computers for teachers	16					

Table 5

Distribution of Probable Date of Occurrence Forecasts

Technology Instruction	A	H	E	L	N	No Answer
More computers in classroom	13	3				
More electronic information	14	2				
More electronic libraries	5	9	2			
More computers to monitor instruction	4	12				
More individualized instruction	14	2				
More home learning	3	3	8	2		

Table 6

Distribution of Probable Date of Occurrence Forecasts

Personnel Administration	A	H	E	L	N	No Answer
Principal more involved in business community	4	8	3	1		
Principal as coordinator of learning	4	10	1	1		
Principal as business manager of learning center	2	3	4	6	1	
More differentiated staffing	3	12	1			

Table 7

Distribution of Probable Date of Occurrence Forecasts

Personnel Instruction	A	H	E	L	N	No Answer
Teacher as instructional leader	1	13	1	1		
Teacher will work with teaching machines	11	5				
Teams will work with students	1	8	6	1		
Teachers will be better paid	7	6	3			
Teachers will be better prepared	9	6			1	

Table 8

Distribution of Time Frame Forecasts

Fiscal Support	1985- 2000	2001- 2020	2021- 2035	2035+	No Answer
Greater private sector support	13	3			
Greater state aid	15	1			
Less federal aid	15	1			
Less funding from property tax	13	3			
More direct voucher funding	9	6		1	

Table 9

Distribution of Time Frame Forecasts

Curriculum	1985- 2000	2001- 2020	2021- 2035	2035+	No Answer
More foreign language	13	3			
More communication skills	13	3			
More humanities and liberal arts	12	4			
More basic skills	14	2			
More computer skills	16				
More performance competency	14	2			
Less formal curriculum	6	9		1	
Less formal school setting	6	7	1	2	
More home-based instruction	6	7	1	1	1
More self-directed learning	12	3		1	

Table 10

Distribution of Time Frame Forecasts

Student Characteristics	1985-2000	2001-2020	2021-2035	2035+	No Answer
Same age	5	9	1	1	
Greater learning capacity	2	10	1	3	
More chemical enhancement	2	9	1	4	
Less restrictive age groupings	3	13			
More emotionally mature	3	12		1	
More job oriented	13	2		1	
No student body	1	3	4	8	

Table 11

Distribution of Time Frame Forecasts

Technology Administration	1985-2000	2001-2020	2021-2035	2035+	No Answer
More computers for administrators	16				
More computers for teachers	16				

Table 12

Distribution of Time Frame Forecasts

Technology Instruction	1985- 2000	2001- 2020	2021- 2035	2035+	No Answer
More computers in the classroom	14	2			
More electronic information	16				
More electronic libraries	12	4			
More computers to monitor instruction	13	3			
More individualized instruction	13	3			
More home learning	4	8	2	2	

Table 13

Distribution of Time Frame Forecasts

Personnel Administration	1985-2000	2001-2020	2021-2035	2035+	No Answer
Principal more involved in business community	14	2			
Principal as coordinator of learning	13	3			
Principal as business manager of learning center	5	10	1		
More differentiated staffing	13	3			

Table 14

Distribution of Time Frame Forecasts

Personnel Instruction	1985- 2000	2001- 2020	2021- 2035	2035+	No Answer
Teacher as instructional leader	15	1			
Teacher will work with teaching machines	16				
Teams will work with students	1	13	2		
Teachers will be better paid	12	4			
Teachers will be better prepared	11	5			

Table 15

Distribution of Impact Forecasts

Fiscal Support	+3	+2	+1	0	-1	-2	-3
Greater private sector support	2	9	4		1		
Greater state aid	6	7	3				
Less federal aid			1		8	2	5
Less funding from property tax	1	1	2	4	3	3	2
More direct voucher funding	3	1	5	1		1	5

Table 16

Distribution of Impact Forecasts

Curriculum	+3	+2	+1	0	-1	-2	-3
More foreign language	2	14					
More communication skills	7	9					
More humanities and liberal arts		12	4				
More basic skills	7	5	2			1	1
More computer skills	5	10	1				
More performance competency	4	9	1	1	1		
Less formal curriculum	2		2	4	3	4	1
Less formal school setting	3	5		2	1	4	1
More home based instruction	1	4	2	4	1	3	1
More self-directed learning	13	3					

Table 17

Distribution of Impact Forecasts

Student Characteristics	+3	+2	+1	0	-1	-2	-3
Same age	2	8	3	1	1		1
Greater learning capacity	6	7	2	1			
More chemical enhancements	3	4	3	2	2		2
Less restrictive age groupings	4	11	1				
More emotionally mature	3	5	3	5			
More job oriented	5	5	1	1	3		1
No student body	1			3		5	7

Table 18

Distribution of Impact Forecasts

Technology Administration	+3	+2	+1	0	-1	-2	-3
More computers for administrators	11	5					
More computers for teachers	12	4					

Table 19

Distribution of Impact Forecasts

Technology Instruction	+3	+2	+1	0	-1	-2	-3
More computers in the classroom	2	12	2				
More electronic information	14	2					
More electronic libraries	5	10	1				
More computers to monitor instruction	3	12	1				
More individualized instruction	14	2					
More home learning	2	5	2	3	1	3	

Table 20

Distribution of Impact Forecasts

Personnel	+3	+2	+1	0	-1	-2	-3
Administration							
<hr/>							
Principal more involved in business community	4	4	8				
Principal as coordinator of learning	7	7	1	1			
Principal as business manager of learning center	2	3	5	1	3	2	
More differentiated staffing	4	11	1				

Table 21

Distribution of Impact Forecasts

Personnel Instruction	+3	+2	+1	0	-1	-2	-3
Teacher as instructional leader	3	12			1		
Teacher will work with teaching machines	13	2	1				
Teams will work with students	2	9	2	2	1		
Teachers will be better paid	12	4					
Teachers will be better prepared	14	2					

Table 22

Mean Responses for Round 2 and Round 3

Fiscal Support					
Probability		Time Frame		Impact	
Round 2	Round 3	Round 2	Round 3	Round 2	Round 3
H	H	1985-2000	1985-2000	+2	+2
H	H	1985-2000	1985-2000	+2	+2
E	E	1985-2000	1985-2000	-1	-2
E	E	1985-2000	1985-2000	0	-1
E	E	2001-2020	2001-2020	0	0

Table 23

Mean Responses for Round 2 and Round 3

Curriculum					
Probability		Time Frame		Impact	
Round 2	Round 3	Round 2	Round 3	Round 2	Round 3
H	H	1985-2000	1985-2000	+2	+2
H	H	1985-2000	1985-2000	+2	+2
H	H	1985-2000	1985-2000	+2	+2
H	H	1985-2000	1985-2000	+2	+2
A	A	1985-2000	1985-2000	+2	+2
H	H	1985-2000	1985-2000	+2	+2
L	L	2001-2020	2001-2020	0	0
E	E	2001-2020	2001-2020	0	0
H	H	1985-2000	1985-2000	+3	+3

Table 24

Mean Responses for Round 2 and Round 3

Student Characteristics					
Probability		Time Frame		Impact	
Round 2	Round 3	Round 2	Round 3	Round 2	Round 3
H	E	2001-2020	2001-2020	+2	+1
H	H	2001-2020	2001-2020	+2	+3
E	E	2001-2020	2001-2020	+1	+1
A	A	2001-2020	2001-2020	+2	+2
H	H	2001-2020	2001-2020	+1	+1
H	H	1985-2000	1985-2000	+2	+1
L	L	2021-2035	2021-2035	-2	-2

Table 25

Mean Responses for Round 2 and Round 3

Technology - Administration					
Probability		Time Frame		Impact	
Round 2	Round 3	Round 2	Round 3	Round 2	Round 3
A	A	1985-2000	1985-2000	+3	+3
A	A	1985-2000	1985-2000	+3	+3

Table 26

Mean Responses for Round 2 and Round 3

Technology - Instruction					
Probability		Time Frame		Impact	
Round 2	Round 3	Round 2	Round 3	Round 2	Round 3
A	A	1985-2000	1985-2000	+2	+2
A	A	1985-2000	1985-2000	+3	+3
H	H	1985-2000	1985-2000	+2	+2
H	H	1985-2000	1985-2000	+2	+2
A	A	1985-2000	1985-2000	+3	+3
E	E	2001-2020	2001-2020	0	+1

Table 27

Mean Responses for Round 2 and Round 3

Personnel - Administration						
Probability		Time Frame		Impact		
Round 2	Round 3	Round 2	Round 3	Round 2	Round 3	
H	H	1985-2000	1985-2000	+2	+2	
H	H	1985-2000	1985-2000	+2	+2	
E	E	2001-2020	2001-2020	+1	+1	
H	H	1985-2000	1985-2000	+2	+2	

Table 28

Mean Responses for Round 2 and Round 3

Personnel - Instruction					
Probability		Time Frame		Impact	
Round 2	Round 3	Round 2	Round 3	Round 2	Round 3
H	H	1985-2000	1985-2000	+2	+2
A	A	1985-2000	1985-2000	+3	+3
H	H	2001-2020	2001-2020	+2	+2
H	H	1985-2000	1985-2000	+3	+3
A	H	1985-2000	1985-2000	+3	+3

Table 29

Trends with Highest Probability of Occurrence

	Probability	Time Frame				Impact	
		1985- 2000	2001- 2020	2021- 2035	2035+	+	-
Fiscal Support	A or H						
Greater private sector support	12	13				15	
Greater state aid	14	15				16	

A = Almost Certain

H = High Probability

Table 30

Trends with Highest Probability of Occurrence

Curriculum	Probability A or H	Time Frame				Impact	
		1985- 2000	2001- 2020	2021- 2035	2035+	+	-
More foreign language	14	13				16	
More communication skills	16	13				16	
More humanities	8	12				16	
More basic skills	14	14				14	
More computer skills	16	16				16	
More performance competency	13	14				14	
More self-directed learning	15	12				16	

A = Almost Certain

H = High Probability

Table 31

Trends with Highest Probability of Occurrence

Student Characteristics	Probability	Time Frame				Impact	
	A or H	1985-2000	2001-2020	2021-2035	2035+	+	-
Same age	9	5	9			13	
Greater learning capacity	13	2	10			15	
Less restrictive age groupings	16	3	13			16	
More emotionally mature	9	3	12			11	
More job oriented	12	13	2			11	

A = Almost Certain

H = High Probability

Table 32

Trends with Highest Probability of Occurrence

	Probability	Time Frame				Impact	
		1985- 2000	2001- 2020	2021- 2035	2035+	+	-
Technology Administration	A or H						
More use of computers for administrators	16	16				16	
More use of computers for teachers	16	16				16	

A = Almost Certain

H = High Probability

Table 33

Trends with Highest Probability of Occurrence

Technology Instruction	Probability A or H	Time Frame				Impact	
		1985- 2000	2001- 2020	2021- 2035	2035+	+	-
More computers in classrooms	16	14	2			16	
More electronic information	16	16				16	
More electronic libraries	14	12	4			16	
More computer monitoring of instruction	16	13	3			16	
More individualized instruction	16	13	3			16	

A = Almost Always

H = High Probability

Table 34

Trends with Highest Probability of Occurrence

Personnel Administration	Probability	Time Frame				Impact	
	A or H	1985-2000	2001-2020	2021-2035	2035+	+	-
Principal more involved in business community	12	14	2		16		
Principal as coordinator of learning	14	13	3		15		
More differentiated staffing	15	13	3		16		

A = Almost Certain

H = High Probability

Table 35

Trends with Highest Probability of Occurrence

Personnel Instruction	Probability A or H	Time Frame				Impact	
		1985- 2000	2001- 2020	2021- 2035	2035+	+	-
Teacher as instructional leader	14	15	1			15	
Teacher will work with teaching machines	16	16				16	
Teams will work with students	9	1	13			13	
Teachers will be better paid	13	12	4			16	
Teachers will be better prepared	15	11	5			16	

A = Almost Certain

H = High Probability

to indicate which trends were given the highest probability of occurrence.

Fiscal Support

According to the select panel of experts, greater emphasis on fiscal support from the private sector-- corporations, industry, and the business community will develop between 1985-2000, and most agreed that this would have a positive impact on the public secondary school. The panel also felt that greater emphasis on funding from state aid would evolve between 1985-2000, and all agreed that this would have a positive impact on the public secondary school.

Curriculum

The select panel of experts believed that the following would occur between 1985-2000 and that all of these factors would have a positive impact on the public secondary school.

1. Greater emphasis on foreign language competency
2. Greater emphasis on communication skills
3. Greater emphasis on humanities and liberal arts education
4. Greater emphasis on a core curriculum stressing basic skills
5. Greater emphasis on computer related skills
6. Greater emphasis on performance competency

7. More emphasis on self-directed, self-initiated learning

Student Characteristics

The select panel of experts believed that the following would occur by 2020 and that all of these factors would have a positive impact on the public secondary school:

1. Student learning capacity will be greater
2. Age will not be restrictive in the learning environment. General age groupings will be retained, but not as restrictively as they are today.
3. Students will be more emotionally mature
4. Students will be more job oriented clients

Technology - Administrative

The select panel of experts believed that the following would occur between 1985-2000 and that both of these trends would have a positive impact on the public secondary school:

1. Greater emphasis on use of computers and information storage and retrieval systems for administrative purposes
2. Greater emphasis on record keeping, clerical duties normally handled by teacher to be handled by computer

Technology - Instructional

The select panel of experts believed that the following trends would occur mostly between 1985-2000 and that all of these instructional trends related to technology would have a positive impact on the public secondary school:

1. Greater emphasis on use of computers in the classroom
2. Greater emphasis on information storage and retrieval of information electronically
3. Greater emphasis on use of electronic libraries, paperless classrooms, and video-discs
4. Greater emphasis on teachers using computers to monitor instruction
5. Greater emphasis on individualized instruction

Personnel - Administrative

The select panel of experts believed that the following would occur prior to 2020 and that all of these factors would have a positive impact on the public secondary school:

1. Greater emphasis will be placed on the principal's being more involved with the business community
2. Greater emphasis will be placed on the principal as leader or coordinator of learning and instruction

3. Greater emphasis will be placed on differentiated staffing

Personnel - Instructional

The select panel of experts believed that the following would occur prior to 2020 and that all of these factors would have a positive impact on the public secondary school:

1. Greater emphasis will be placed upon the teacher as an instructional leader
2. Greater emphasis will be placed on teachers being able to work with assistance from computers and other teaching machines
3. Greater emphasis will be placed on teams of analysts, data specialists, and clerical aides who will work with students
4. Teachers will be better paid
5. Teachers will be better prepared before entering the classroom

Lowest Probability of Occurrence - Table 36

The trends forecasted by probability, date of occurrence, and impact were summarized in these tables in order to indicate which trends were given the lowest probability of occurrence. They include:

1. Less emphasis on formal curriculum

Table 36

Trends with Lowest Probability of Occurance

	Probability L or NL	Time Frame				Impact Negative
		1985- 2000	2001- 2020	2021- 2035	2035+	
Curriculum						
Less emphasis on formal curriculum	11	6	9			8
Less emphasis on formal school setting	8	6	7	1	2	6
Student Characteristics						
No student body/no public secondary school	15			4	8	12

L = Low

NL = No Likelihood

2. Less emphasis on formal school setting
3. A student body will not exist because there will be no public secondary school

Curriculum

According to the select panel of experts, less emphasis on formal curriculum had a low probability of occurring by 2020. The panel felt that less emphasis on a formal curriculum would have a negative impact on the public secondary school as we know it today.

Student Characteristics

The lowest probability of occurrence among all items in the survey was found in the reply to the futuristic trend indicating that a student body will not exist because there will be no public secondary school. Fifteen experts felt that there was a low probability of that situation occurring--even by the year 2035. The majority indicated that this factor would have a negative impact on the public secondary school.

No Consensus Reached - Table 37

The select panel of experts felt that there was an even chance of the following items taking place or not taking place. Therefore, it was determined that the select panel could not reach consensus on the following items:

Fiscal Support

1. Less emphasis on funding from Federal aid
2. Less emphasis on funding from property taxes
3. More emphasis on direct funding to individuals through a voucher system

Curriculum

1. Less emphasis on a formal school setting
2. More emphasis on home-based instruction

Student Characteristics

1. Student age will remain about the same
2. Greater emphasis on artificial intelligence and chemical enhancements to improving learning

Technology - Instructional

1. Greater emphasis on home learning via electronic delivery systems

Personnel - Administrative

1. Principal will be more of a business manager whose job will be to effectively maintain the learning center/learning systems

Table 37

No Consensus Reached

	Probability	Time Frame				Impact	
		1985- 2000	2001- 2020	2021- 2035	2035+	+	-
Fiscal Support	E						
Less federal aid	E						
Less property tax funding	E						
More voucher funding	E						
<hr/>							
Curriculum							
<hr/>							
Less formal school setting	E						
More home based instruction	E						

E = An even chance of occurring or not occurring

Table 37 (Continued)

	Probability	Time Frame				Impact	
		1985- 2000	2001- 2020	2021- 2035	2035+	+	-
Student Characteristics	E						
Same age	E						
More chemical enhancements	E						
Technology Instruction							
More home learning	E						
Personnel Administration							
Principal as business manager of the learning center	E						

Table 38

Data Gathering Schedule and Questionnaire

	Response Rate	
	Date	Percent Return
Round One	January 1985	100%
Round Two	February 1985	100%
Round Three	March 1985	100%
Round Four	June 1985	No return necessary

CHAPTER 5

CONCLUSIONS AND IMPLICATIONS

One of the glaring ironies of modern education is that schools try to prepare students to live in a time that does not yet exist by concentrating their studies on a time that has ceased to exist (Fitch & Svengalis, 1979, 17).

This chapter contains the following:

1. Restatement of the Problem
2. Statement of Purpose
3. Research Procedures
4. Conclusions and Implications
5. Comparisons of Futuristic Trends with Current Literature
6. Summary
7. Speculations
8. Recommendations for Further Study

Restatement of the Problem

The purpose of this study was to determine possible futures for the public secondary school by the year 2035 and beyond. Research was conducted using a modified Delphi technique, a panel of experts, and an indepth review of literature in the field of educational futures.

The goals of this study focused on the following research questions regarding the future of the public secondary school by the year 2035 and beyond:

1. Within the next 50 years what changes relating to the fiscal support, administrative personnel, and instructional personnel are likely to occur in the public secondary schools?
2. Within the next 50 years what curriculum changes and changes in student characteristics are likely to occur?
3. What specific changes in instructional and administrative technology will take place during the next 50 years?
4. What impact will the changes in fiscal support, personnel, characteristics of the student body, curriculum and technology have on the public secondary school?

Purpose of the Study

The primary purpose of this study was to identify projected critical changes in the public secondary schools of the future as perceived by a panel of experts. By identifying these critical changes for the year 2035 and beyond, long range planning should be improved for the public secondary school. The first major step in planning

for the future is to have some conceptual knowledge of what the future will hold. Obviously, decisions that are made now will shape the future. Therefore, it is important to make the best decisions possible today. In order to make the most intelligent plans for the public secondary schools of the future, educators should have available to them the best possible thinking concerning what that future world will look like and what modifications in the public secondary schools of the future are likely to occur. Only then can educators plan appropriately.

Research Procedures

This study assembled a series of conjectures concerning the nature of U. S. secondary schools in the year 2035 and beyond. A panel of 18 possible participants were initially elected and asked to participate in three rounds of a modified Delphi study. This panel of experts consisted of top level United States educational leaders, and are listed in Appendix E.

Round 1

The first mailing (Appendix A) was sent to 18 possible participants. These identified experts were asked to provide their opinions concerning changes for each of seven open-ended statements of identified components of the public secondary school. The seven areas included

the following: fiscal support, curriculum, technology--administration, technology--instruction, student characteristics, personnel--administrative, personnel--instructional. They were also asked to give their opinion on what impact these changes would have on the public secondary school of the future. The opinion statements for Round 1 were summarized, edited, and synthesized into a questionnaire for Round 2.

Round 2

In Round 2, each panel member was asked to read each statement concerning a futuristic trend, estimate how likely it was that the change would occur, estimate the year the change would be most likely to occur by using the temporal intervals provided, and indicate the impact of the change on the public secondary school as we know it today. Round 2 returns were tabulated and a mean was calculated for each item within each of the three categories--probability, timeframe, and impact. Round 3 was prepared giving the average group response for each of the 39 items for each of the three categories. Panel members were also given their own Round 2 responses for each of the 39 items.

Round 3

Each panel member was instructed to compare his/her own response to Round 2 with the average group response.

Panel members were told that they could remain with their original response, but that consensus was the objective. The mean was calculated for Round 3 to determine if consensus was reached. The data were analyzed, the findings of the study were tabulated, and the results were mailed to the select panel of experts.

Final Mailing

The final mailing was sent to the 16 members of the Select Panel of Experts. It included a letter, the results of the study instrument, and a list of the panel of experts.

Conclusions and Implications

Conclusions of this study are based on probability, impact, and date of occurrence. The conclusions are presented according to the categories set forth in the purpose of the study.

Fiscal Support

According to the select panel of experts, greater emphasis on fiscal support from the private sector will take place between 1985-2000, and there was consensus that this would have a positive impact on the public secondary school. The panel felt that greater emphasis on funding from state aid would take place between 1985-2000, and

all agreed that this would have a positive impact on the public secondary school. The panel felt that the probability of less emphasis on funding from Federal Aid and less emphasis on funding from property taxes had an even probability of occurring between the years of 1985-2000 and that both of these trends would have a negative impact on the public secondary school. The survey indicated that there is an even chance of more emphasis on direct funding to individuals through a voucher system that will occur between the years of 2001 - 2020, but that it will not have a significant impact on the public secondary school.

Curriculum

The select panel of experts believed that the following trends have a high probability (60-89 percent) of occurrence between 1985-2000 and that all of these factors will have a positive impact on the public secondary school:

1. Greater emphasis on foreign language competency
2. Greater emphasis on communication skills
3. Greater emphasis on humanities and liberal arts education
4. Greater emphasis on stressing basic skills

5. Greater emphasis on performance competency

Greater emphasis on computer related skills is almost certain (90 percent chance or greater) to occur between 1985-2000 and this will have a strong positive impact on the public secondary school.

Less emphasis on a formal curriculum was thought to have a low probability (10-39 percent) of occurrence between the years of 2001-2020 and to have no impact on the public secondary school.

Less emphasis on a formal school setting and more emphasis on home-based instruction was believed to have an even chance of occurring between 2001-2020 and would not have an impact on the public secondary school.

The panel indicated that more emphasis on self-directed, self-initiated learning had a high probability of occurring between 2001-2020 and that this trend would have a very strong positive impact on the public secondary school.

Student Characteristics

The select panel of experts indicated that there is an even chance of student age remaining about the same and that there is an even chance that there will be greater emphasis on chemical enhancements to improve learning between 2001-2020 and that both of these would have a mild positive impact on the public secondary school.

The panel felt that the probability was almost certain that between 2001-2020 that general age groupings in school will continue, but that these groupings would not be as restrictive as today. The panel indicated that this trend would have a strong positive impact on the public secondary school.

Trends indicating student learning capacity to be greater and students to be more emotionally mature by 2020 have a high probability of occurrence. Both will have a strong positive impact on the public secondary school.

Between 1985-2000 a high probability exists that students will be more job-oriented. This is considered to present a mild positive impact on the public secondary school.

The only student characteristic trend considered by the panel of experts to present a strong negative impact on the public secondary school was the trend indicating that a student body will not exist because there will be no public secondary school. The panel felt the probability of occurrence of this trend was low (10-39 percent) and the occurrence, if any, would be between the years 2021-2035.

Personnel - Instruction

The panel of experts indicated that the following trends had a high (60-89 percent) probability of occurrence

between 1985-2000 and that they would have a very strong positive impact on the public secondary school:

1. Teachers will be better paid
2. Teachers will be better prepared before entering the classroom

The trend showing greater emphasis on the teacher as an instructional leader was found to have a high probability of occurrence between 1985-2000 with a strong positive impact on the public secondary school.

Between 2001-2020 the panel thought there would be a high probability that greater emphasis will be place on teachers being able to work with assistance from computers and other teaching machines. The panel thought this would have a very strong positive impact on the public secondary school.

Personnel - Administration

The only futuristic trend in this category found to have an even chance of occurrence 2001-2020 related to the principal being more of a manager whose job it would be to effectively maintain the learning center/learning systems. The panel felt this trend would have a mild positive impact on the public secondary school.

Three of the four trends in this category were thought to have a high probability of occurrence between 1985-2000 and would have a strong positive impact on the

public secondary school. Those three trends are as follows:

1. Greater emphasis will be placed on the principal as leader or coordinator of learning and instruction.
2. Greater emphasis will be placed on the principal as leader or coordinator of learning and instruction.
3. Greater emphasis will be placed on differentiated staffing.

Technology - Instruction

The following futuristic trends were found to have an almost total probability of occurrence between 1985-2000. The first two were judged to present a very strong positive impact on the public secondary school and the last one presented a strong positive impact.

1. Greater emphasis on information storage and retrieval of information electronically.
2. Greater emphasis on individualized instruction.
3. Greater emphasis on use of computers in the classroom.

The following two trends were given a high probability of occurrence between 1985-2000 and were shown to present a strong positive impact:

1. Greater emphasis on electronic libraries, paperless classrooms, and videodiscs.

2. Greater emphasis on teachers using computers to monitor instruction.

The only trend in this category thought by the panel to have an even chance of occurrence between 2001-2020 was the trend concerning greater emphasis on home learning via electronic delivery systems. The panel felt that this trend would have a mild positive impact on the public secondary school.

Technology - Administration

The panel felt that within the years 1985-2000 the probability was almost certain that both these trends would have a very strong positive impact on the public secondary school:

1. Greater emphasis on use of computers and information storage and retrieval systems for administrative purposes.
2. Greater provision for record keeping and clerical duties, normally handled by teachers, to be handled by computers.

Comparison of Futuristic Trends

With Current Literature

The intention of this section was to discuss the results of this study as they were related to the current

literature on the subject of the future of the public secondary school. Writers of scholarly works concerning the public secondary school of the future tended to deal with retraining of workers, business/education partnerships and high technology impact on the public secondary school as we know it today.

The literature found in Chapter 2 served as representative of current thoughts on the public secondary school of the future. The cited literature was not totally exhaustive of all present thought on the topic of the public secondary school of the future, but a broad cross-section of available data was presented.

Fiscal Support

Current literature and the panel of experts were in agreement that funding of the public secondary schools is vital to the well-being of the institution.

Several authors such as Ruffin (1983), Gores (1976), Jennings (1982), and Cornish (1977) agreed with the panel of experts who gained consensus on two factors--there will be greater emphasis on funding from the private sector and greater emphasis on funding from state aid.

Curriculum

Current literature and opinions by the panel of

experts indicate an almost certainty that continually increased emphasis on computer-related skills will occur. Much of the literature centers upon the changes that may affect curriculum with the advent of high technology (Markert, 1984, and Shane, 1981 b).

One of the trends forecasted as having a high probability of occurrence by the panel of experts, "greater emphasis on communication skills," is supported in the literature by Hawley (1984), Hettlinger (1983), and Kenney (1981).

Another trend forecasted as having a high probability of occurrence by the panel of experts, "more emphasis on self-directed, self-initiated learning," is supported in the literature by Larson (1983), Shane (1981 b), and Hawley (1984).

Shane, Larson, and Hawley all agree that a wide range of skills will be needed in the future. The panel of experts took a similar position by assigning a high probability of occurrence rating to "greater emphasis on foreign language competency, humanities and liberal arts education, and a core curriculum stressing basic skills."

Student Characteristics

The select panel of experts forecasted that the probability was high that students learning capacity would be greater and that students would be more

emotionally mature. The literature displays mixed reviews on both of these trends. Henderson (1983) thinks students will have a broader science background, but Kenny (1981) feels that students of the future will lack the ability to think critically.

Students being more job-oriented clients ranked high on the probability of occurrence rating by the panel of experts. Dragseth, in a Delphi study pointed out in the literature review, substantiates this trend through his conclusion that students will attend school on a part-time basis. Therefore, cooperative work programs or individualized work programs will be an integral part of a secondary school education.

The select panel of experts forecasted an almost certain probability that age would not be as restrictive in the learning environment. Much of the literature tends to support this trend. Marvin Cetron's latest book provides a prediction that schools will be used for adult education and training (Cetron, 1985).

The majority of the panel of experts felt that the probability was low that a public secondary school would not exist. Much of the literature supports this forecast and indicates that the public schools will be restructured. Cetron even cites major changes including fast food service, babysitting, geriatric care, electronic banking

and recreational facilities (Cetron, 1985).

Personnel - Instruction

The panel of experts felt there was a high probability of occurrence that:

1. Greater emphasis will be on the teacher as an instructional leader.
2. Teachers will be better paid.
3. Teachers will be better prepared before entering the classroom.
4. Greater emphasis will be placed on teams who will work with students.

These trends are supported in the literature by Cetron (1985). He describes a team consisting of an instructional director working with diagnostic resource managers to insure instructional quality. Teachers will work closely with these managers and will be a part of the decision-making team.

The panel of experts in this study indicated that there was an almost certain probability that greater emphasis will be placed on teachers being able to work with assistance from computers and other teaching machines. This trend is supported in the literature by Dede (Jennings & Cornish, 1982). Dede states, "Eventually, 'training' may be almost completely done by machine, while 'educating' will be facilitated by people." (Dede, 1983, 43).

Personnel - Administration

The panel of experts predicted a high probability that the following trends would occur:

1. Greater emphasis will be placed on the principal being more involved with the business community.
2. Greater emphasis will be placed on the principal as leader or coordinator of learning and instruction.
3. Greater emphasis will be placed on differentiated staffing.

These trends are supported in the literature by Dede (1981), Cetron (1985), and Ruffin (1983). Dede speaks of work-sharing programs, technological innovations, and other modifications to current life styles with which administrators in the learning environment will need to deal in order to make decisions concerning programs. Ruffin (1982) speaks of the effect of strong instructional leadership or improvement in quality education. Cetron (1985) describes the instructional team consisting of an instructional director, a diagnostic resource manager, and a teacher.

Technology - Instruction

The select panel of experts forecasted that the following futuristic trends were almost certain to occur:

1. Greater emphasis on use of computers in the classroom.
2. Greater emphasis on information storage and retrieval of information electronically.
3. Greater emphasis on individualized instruction.

Shostak (1981), Larson (1983), and Dede (1983) give support in the literature to these trends. Shostak (1981) believes that students could study at home with the aid of computer-based libraries. Cetron (1985) believes that students will be learning at home one or two days a week through the use of computer technology. Larson (1983) believes this enhanced technology will permit teachers to be more creative in their teaching while using technology to do more routine functions. Cetron (1985) believes this new technology will permit teachers to work in teaching assignments where they are most qualified and most comfortable.

A high probability of occurrence was forecasted by the panel of experts for:

1. Greater emphasis on electronic libraries, paperless classrooms and videodiscs.
2. Greater emphasis on teachers using computers to monitor instruction.

These trends are supported in the literature by Dillon and Wright (Jennings, (1982), Shostak (1981), Dede (1981), and Cetron (1985). These individuals believe that books will not be totally replaced by the computer. However, the disadvantages of books can be eased with the use of computerized workbooks and computerized textbooks. The materials can be easily updated, corrected, and they are adaptable to creating different approaches in teaching strategies.

Even though much information is cited in the literature that indicates the trend for more emphasis on home learning through electronic delivery systems, the select panel of experts only forecasted that trend as having an even probability of occurrence.

Technology - Administration

The select panel of experts agreed that there is an almost certain probability that record keeping, clerical duties, and information storage and retrieval systems used for administrative purposes will occur.

These trends are supported in the literature by Dede (1981), Cetron (1985), and Shane (Jennings and Cornish, 1982). However, Dede (1981) warns that educators must be careful to introduce these technologies in areas where they will be cost effective and not merely used as a substitute for human instructors.

Summary

The purpose of this study was to identify futuristic trends for the public secondary school. The following conclusions were supported by the data collected and analyzed in this study.

1. The public secondary school of the future will have greater fiscal support from the private sector and from state aid. The public secondary school of the future will have more differentiated staffing, a principal who is looked upon as the leader or coordinator of learning and who is heavily involved with the business community.
2. The public secondary school of the future will place greater emphasis upon computer related skills and the curriculum will display a wide variety of courses with emphasis on self-directed, self initiated learners.
3. The public secondary school of the future will display electronic libraries, paperless classrooms, videodiscs and computers in the classrooms, more individualized instruction and teachers using computers to monitor instruction, and to store and retrieve administrative and educational information.
4. The public secondary school of the future will

contain a student population with general age groupings who are more job oriented, more emotionally mature, and who have a greater learning capacity. The public secondary school of the future will have teachers who will work with assistance from computers, teaching machines, teams of analysts, and data specialists. The teacher will be better prepared as an instructional leader and will be better paid.

5. The following observations were made concerning the Delphi technique during the course of this study:
 - A. A total of 16 experts participated in the study. A 100 percent rate of return was achieved. This was a superb return rate because the study covered three separate questionnaires over a four-month period of time. The questionnaires required a great deal of time to complete and required some careful thought on the part of the select panel of expert participants. Additionally, these participants were all very busy individuals.
 - B. During the three rounds of the questionnaire, the participants developed consensus in most of the futuristic trends.

- C. Participants maintained a high interest level throughout the process. Very few contacts were needed to remind participants of the deadline dates.
 - D. Several respondents made additional and supportive comments on each round of the questionnaires.
6. The trends identified as highest probability of occurrence were consistent with the literature.
 7. The panel of experts tended to forecast for the early time frame (1985-2000) and were reluctant to make long-range predictions. Only one of the predictions was from the 2021-2035 time frame category and none of the trends were placed in the 2035+ time frame. Twenty-five of the 39 trends were forecasted for the 1985-2000 time frame category.

Researcher Comments

The researcher believes that this study points to some major problems in planning for changes in educational systems. The panel of experts expressed reluctance in making long-range predictions (beyond 2000). This presents some evidence that it is very difficult even for top-level leadership in the educational arena to visualize and develop long-range plans. If top-level educational leadership continues to be

reluctant to provide society with a vision for the future coupled with a long-range planning process, the future of the public secondary school will remain clouded with inconsistencies and will continue to drift in a sea of day-to-day demands. Educational leaders tend to be so busy with day-to-day activities that it is difficult to break away from thinking only about the condition of the educational system as we know it today. It did not appear to be difficult for the panel of experts to predict changes that would take place within the structure of the public secondary school as it exists today. However, many of the panelists were reluctant to project that these changes would have an impact on other societal structures. For example, all sixteen participants believed that there would be more computers in the classroom, more electronic retrieval of information, and more computers to monitor instruction. However, only six of the sixteen experts felt that this would result in more home learning through electronic media. In our vision of the public secondary school of the future there is a need to expand this vision beyond the "walls of learning" that exist today.

Speculations

What will the public secondary schools look like in the year 2035? The researcher believes that schools will be heavily home-based, electronically managed, and much more individualized. The home as an institution will be very

prominent. The formal school setting will likely be very different from today. Students will come and go as scheduled. Learning will be a must, and accountability for learning will be very intense. More learning will be brought to more people more economically, more effectively, and more personalized than it was in the schools in 1985. Learning will occur in homes, special community learning centers, other people's homes and business and industry settings, usually through electronic systems.

Suggestions for Further Research

The purpose of this study was to identify trends for the public secondary school of the future. The Delphi technique was used to develop these trends from a panel of experts. The results, as presented, indicate good potential for the study of the public secondary school of the future.

An additional purpose of any research is to stimulate ideas for further research. As a result of this study, several recommendations are offered for consideration.

1. There is a lack of long-term, follow-up research on topics dealing with the public secondary school; specifically, in the areas of administrative technology and fiscal support.
2. Additional studies using another panel of experts and replicating this study would be useful in confirming the reliability and validity of this study.

3. Additional thought needs to be given to the "probable date of occurrence" section of the study. Participants in the study seemed to have difficulty thinking very far into the future.
4. Synthesize the literature relating to the public secondary school of the future.
5. It would be useful to conduct additional indepth Delphi studies on any one of the seven areas of futuristic trends in this study.
6. Priority rankings within each category would provide additional data on futuristic trends.
7. A study that would use a similar panel of experts and would deal with a long-range planning process or an alternative planning model would be an interesting follow-up to this study.
8. Another interesting follow-up study could deal with the specific impact of the changes that are forecasted in this study.
9. An interesting study would most likely result if variable stimuli were applied which would spur the panel to consider the "nonobvious conclusions."
10. A study that would be composed of students, top-level business leaders, or new teachers would be an interesting follow-up study.
11. An interesting result would likely occur if a study were designed and based on a thematic thrust, such as the elimination of illiteracy.

APPENDIX A

January, 1985

_____:

As you recall from our recent telephone conversation, I am a Doctoral student at Virginia Polytechnic Institute and State University in Blacksburg, Virginia. I am conducting a study of opinions to determine some possible futures for secondary education. My study will explore secondary education in the year 2035. The results will become part of my doctoral dissertation which is entitled: Education in the Year 2035: A Delphi Study to Identify Possible Futures of Public Secondary Schools.

Your opinions about possible futures for secondary education are important to this study because of your expertise in this field. You have been recommended to me as an exceptionally qualified participant by members of my Doctoral Committee at VPI.

Your opinions about possible futures in secondary education will be collected in the following way:

1. This is the first mailing. Please complete the enclosed Questionnaire and return it in the enclosed post-paid envelope.

2. When Questionnaire #1 is received, your statements will be classified into categories of possible futures of secondary education. In the second mailing you will receive the categorized opinions of all the participating panel members, and you will then have the opportunity to react to those statements.

3. The third mailing will entail essentially the same process as the one outlined in #2 above. The goal will be to have reached some consensus among the participants.

This technique will resemble a round-table discussion but without a face to face meeting. You will have the opportunity to see your own ideas and those of the others on the panel.

Each one of the three questionnaires will take no longer than 10-15 minutes of your time. A return envelope will be provided for your responses. However, should you desire, I will be happy to take your answers to questionnaires by phone if that is easier for you.

Your responses will remain anonymous to the other participants. There are no right or wrong answers--it is your

honest opinion that is being sought. Your experience and professional expertise is truly important and I will sincerely appreciate your participation.

Please complete Questionnaire #1 and the attached memo and return both of them to me in the enclosed pre-addressed, postage-paid envelope by January 25. If you desire to give your response to me by phone, simply return the memorandum in the post-paid envelope and I will call you and take your responses by phone. Your support in this project will be greatly appreciated. I am looking forward to working with you.

Sincerely,

Linda M. Combs

Enclosures: Memo
Questionnaire #1
Return envelope

Memorandum

TO: Linda M. Combs
1515 S. Jefferson Davis #1319
Arlington, VA 22202

FROM: _____

Phone: _____

DATE: Postmarked by January 25, 1985

TOPIC: Response to invitation to serve as member of the
Select Panel of Experts

_____ I am pleased to serve as a member of your select
panel on educational futures and look forward to
receiving the two remaining opinionnaires.

_____ I prefer to return my answers by mail to you in
a post-paid envelope.

_____ I prefer to give my answers to you by phone.

Please call me at () _____ at the following
times _____

_____ I regret that I will not be able to serve as a
member of your Select Panel.

Comments: _____

QUESTIONNAIRE #1Fiscal Support

Definition: How the secondary school will be financially supported -- e.g., quality and quantity of funding, origin of financial resources

Question: In my opinion, in the year 2035 the major changes in the fiscal support of the organizational structure of the public secondary school will be as follows:

Curriculum

Definition: Content and learning experiences

Question: In my opinion, in the year 2035 the major changes in the curriculum of the public secondary school will be as follows:

TechnologyAdministration

Definition: Effective management of resources

Question: In my opinion, in the year 2035 the major changes in technology as it relates to administration of the public secondary school will be as follows:

TechnologyInstruction

Definition: Uses of electronic media in the classroom, e.g., computers, video tapes, videodiscs, microwave transmissions and receptions, et cetera

Question: In my opinion, in the year 2035 the major changes in technology relating to instruction will be as follows:

Student Characteristics

Definition: What the typical student in the public secondary school will be like, i.e., age, ability, learning goals and objectives

Question: In my opinion, in the year 2035 the major changes in the student characteristics of the student body of the public secondary school will be as follows:

PersonnelAdministrative

Definition: Management of professional and support staff

Question: In my opinion, in the year 2035 the major changes in the administrative personnel of the public secondary school will be as follows:

Personnel

Instructional

Definition: Persons who provide assistance in learning

Question: In my opinion, in the year 2035 the major changes in instructional personnel will be as follows:

Impact

What impact will all the changes you previously discussed have on the public secondary school?

APPENDIX B

1515 South Jeff Davis

#1319

Arlington, VA 22202

February 24, 1985

ROUND 2 -- POSSIBLE FUTURES OF THE PUBLIC SECONDARY SCHOOL

Thank you for your participation in my study of the possible futures of the public secondary school. As you will recall from Questionnaire #1, my study is a conjecture about the public secondary school in the year 2035.

Your statements of opinion from Questionnaire #1 were classified into possible futures for the public secondary school. In this mailing (Round 2) you will have the opportunity to react to the classified statements of other participants and see your own ideas in relation to those of your peers.

Your responses will remain anonymous to other participants. There are no right or wrong answers. Your honest opinion is what really counts. Your experience and professional judgment is highly valued.

Please complete the Round 2 Questionnaire, which is enclosed, and return it to me in the enclosed post-paid envelope post-marked by March 13. Your participation as a member

page 2

of my select panel is sincerely appreciated. I look forward to receiving your Round 2 response.

Linda M. Combs

Enclosures: Round 2 Questionnaire

Directions for Questionnaire

Post-paid Envelope

DIRECTIONS FOR ROUND 2

1. You will need to refer to this sheet while completing the Round 2 Questionnaire. Place it in a convenient spot for easy reference.
2. In the heading entitled "Futuristic Trend," note the trend and definition for each section: for example, FISCAL SUPPORT...
3. Read each numbered statement under the trend and definition. EXAMPLE: 1. Greater emphasis on fiscal support from the private sector...
4. In the column entitled "Probability," place an "X" under the symbol representing your estimate of how likely the change is to occur using the following symbol definitions:
A--almost certain to occur, 90% chance or greater
H--high probability of occurrence, 60-89%
E--an even chance of occurring or not occurring, 40-59%
L--low probability of occurrence, 10-39%
N--almost no likelihood of occurrence, 9% chance or less
5. In the column entitled "Time Frame," place an "X" under the range of years in which you believe the change will most likely occur.
6. In the column entitled "Impact," place an "X" under the number which indicates your estimate of the impact of the change on the public secondary school as it is

known today.

+3--a very strong positive impact

+2--a strong positive impact

+1--a mild positive impact

0--no impact, either positive or negative

-1--a mild negative impact

-2--a strong negative impact

-3--a very strong negative impact

7. Please sign your name on the line provided on the last page if you have selected the option of returning your response to me by mail.
8. Return the Round 2 Questionnaire to me in the enclosed post-paid envelope postmarked by March 13, 1985. Again, thank you for taking the time to participate in this study. Your input is very important to the study, and I look forward to receiving your return.

POSSIBLE FUTURES OF THE PUBLIC SECONDARY SCHOOL

Comments:

Futuristic Trend	Probability					Time Frame				Impact						
	A	H	E	L	N	1985-2000	2001-2020	2021-2035	2035+	+3	+2	+1	0	-1	-2	-3

Fiscal Support: In the year 2035 major changes in the fiscal support of the public secondary school will be as follows:

1. Greater emphasis on fiscal support from the private sector -- corporations, industry, and the business community
2. Greater emphasis on funding from state aid
3. Less emphasis on funding from Federal aid
4. Less emphasis on funding from property taxes
5. More emphasis on direct funding to individuals through a voucher system

Futuristic Trend

Probability					Time Frame				Impact											
A	H	E	L	N	1985-2000		2001-2020		2021-2035		2035+			+3	+2	+1	0	-1	-2	-3

Curriculum: In the year 2035, major changes in curriculum of the public secondary school will be as follows:

1. Greater emphasis on foreign language competency
2. Greater emphasis on communication skills
3. Greater emphasis on humanities and a liberal arts education
4. Greater emphasis on a core curriculum stressing basic skills
5. Greater emphasis on computer related skills
6. Greater emphasis on performance competency
7. Less emphasis on formal curriculum

Futuristic Trend

Probability					Time Frame				Impact						
A	H	E	L	N					+3	+2	+1	0	-1	-2	-3
					1985-2000	2001-2020	2021-2035	2035+							

Curriculum (Continued): In the year 2035, major changes in curriculum of the public secondary school will be as follows:

8. Less emphasis on a formal school setting
9. More emphasis on home-based instruction
10. More emphasis on self-directed, self-initiated learning

Futuristic Trend	Probability					Time Frame				Impact						
	A	H	E	L	N	1985-2000	2001-2020	2021-2035	2035+	+3	+2	+1	0	-1	-2	-3

Student Characteristics: In the year 2035, major changes in the student characteristics of the student body of the public secondary school will be as follows:

1. Student age will remain about the same
2. Student learning capacity will be greater
3. Greater emphasis on artificial intelligence and chemical enhancements to improve learning
4. Age will not be restrictive in the learning environment. General age groupings will occur, but not as restrictive as today
5. Students will be more mature emotionally

Futuristic Trend

Probability					Time Frame				Impact						
A	H	E	L	N	1985-2000	2001-2020	2021-2035	2035+	+3	+2	+1	0	-1	-2	-3

Student Characteristics (Continued): In the year 2035, major changes in the student characteristics of the student body of the public secondary school will be as follows:

- 6. Students will be more job oriented clients
- 7. A student body will not exist because there will be no public secondary school

Futuristic Trend

Probability					Time Frame				Impact						
A	H	E	L	N	1985-2000	2001-2020	2021-2035	2035+	+3	+2	+1	0	-1	-2	-3

Technology-Administration:

In the year 2035, major changes in technology as it relates to administration of the public secondary school will be as follows:

1. Greater emphasis on use of computers and information storage and retrieval systems for administrative purposes
2. Greater emphasis on record keeping and clerical duties normally handled by teacher to be handled by computer

Futuristic Trend

Probability	Time Frame	Impact
A H E L N	1985-2000 2001-2020 2021-2035 2035+	+3 +2 +1 0 -1 -2 -3

Technology--Instruction: In the year 2035, major changes in technology relating to instruction will be as follows:

1. Greater emphasis on use of computers in the classroom
2. Greater emphasis on information storage and retrieval of information electronically
3. Greater emphasis on electronic libraries, paperless classrooms, and videodiscs
4. Greater emphasis on teachers using computers to monitor instruction
5. Greater emphasis on individualized instruction
6. Greater emphasis on home learning via electronic delivery systems

Futuristic Trend

Probability					Time Frame				Impact						
A	H	E	L	N	1985-2000	2001-2020	2021-2035	2035+	+3	+2	+1	0	-1	-2	-3

Personnel--Administration:

In the year 2035, major changes in the administrative personnel of the public secondary school will be as follows:

1. Greater emphasis will be placed on the principal being more involved with the business community
2. Greater emphasis will be placed on the principal as leader or coordinator of learning and instruction
3. Principal will be more of a business manager whose job will be to effectively maintain the learning center/learning systems
4. Greater emphasis will be placed on differentiated staffing

Futuristic Trend

Probability	Time Frame	Impact
A H E L N	1985-2000 2001-2020 2021-2035 2035+	+3 +2 +1 0 -1 -2 -3

Personnel--Instruction: In the year 2035, major changes in instructional personnel will be as follows:

1. Greater emphasis will be on the teacher as an instructional leader
2. Greater emphasis will be placed on teachers being able to work with assistance from computers and other teaching machines
3. Greater emphasis will be placed on teams of analysis, data specialists, and clerical aids who will work with students
4. Teachers will be better paid
5. Teachers will be better prepared before entering the classroom

Respondent Name

APPENDIX C

March 20, 1985

ROUND 3--POSSIBLE FUTURES OF THE PUBLIC SECONDARY SCHOOL

This is the final round in my study of the possible futures of the public secondary school. Your participation has been extremely beneficial and sincerely appreciated.

As you will recall, my study is a conjecture about the public secondary school in the year 2035. The Round 2 Questionnaires were analyzed and an average response was calculated for each futuristic trend as to its probability of occurrence, probable time of occurrence and its impact on the public secondary school. These group averages for each futuristic trend were then printed on your Round 3 Questionnaire, along with your Round 2 responses. In this mailing (Round 3), you will have the opportunity to reassess your responses in relation to those of your peers.

As always, your responses will remain anonymous to other participants. There are no right or wrong answers; your honest opinion is what really counts. Your experience

and professional judgment are highly valued.

Please complete the Round 3 Questionnaire, which is enclosed, and return in the enclosed envelope postmarked by April 4, 1985. Thank you for your interest, your time, and your support. I look forward to receiving your Round 3 (and final) return! You will receive a final mailing which will include the results of this study as well as a list of the people with whom you have shared the "round table" discussion.

Linda M. Combs

Enclosures: Round 3 Questionnaire
Directions for Questionnaire
Post-paid Envelope

DIRECTIONS FOR ROUND 3

1. You will need to refer to this sheet while completing the Round 3 Questionnaire. Place it in a convenient spot for easy reference.
2. In the heading entitled "Futuristic Trend," note the trend and definition for each section: for example, FISCAL SUPPORT...
3. Read each numbered statement under the trend and definition. EXAMPLE: 1. Greater emphasis on fiscal support from the private sector...
4. Under each heading (Probability, Time Frame, Impact) there are three columns:
 - a. The "Round 2 Average" column indicates the average estimates (average responses) of all respondents.
 - b. "Your Rating Round 2" column indicates your rating on Round 2.
 - c. The "New Rating" column provides the opportunity for you to:
 - (1) compare your estimate (Your Rating Round 2) with the group average (Round 2 Average).
 - (2) reassess each "Futuristic Trend."
 - (3) change your estimate for each trend for which you feel your previous estimate was inaccurate. Consensus is the goal but you may wish to stick with your original estimate.

5. Under "Probability" in the "New Rating" column, estimate how likely the change is to occur using the following symbols:
 - A--almost certain to occur, 90% chance or greater
 - H--high probability of occurrence, 60-89%
 - E--an even chance of occurring or not occurring, 40-59%
 - L--low probability of occurrence, 10-39%
 - N--almost no likelihood of occurrence, 9% chance or less
6. In the column entitled "Time Frame," in the "New Rating" column, use the following scale to indicate the impact of the change on the public secondary school as it is known today.
 - +3--a very strong positive impact
 - +2--a strong positive impact
 - +1--a mild positive impact
 - 0--no impact, either positive or negative
 - 1--a mild negative impact
 - 2--a strong negative impact
 - 3--a very strong negative impact
7. Return Round 3 Questionnaire to me in the enclosed post-paid envelope postmarked by April 4. Again many thanks! I look forward to your return.

POSSIBLE FUTURES OF THE PUBLIC SECONDARY SCHOOL

	Probability			Time Frame			Impact		
	Round	Your	New	Round	Your	New	Round	Your	New
	2	Rating	Rating	2	Rating	Rating	2	Rating	Rating
Futuristic Trend									
	Average Round			Average Round			Average Round		
	2			2			2		

Fiscal Support: In the year 2035 major changes in the fiscal support of the public secondary school will be as follows:

1. Greater emphasis on fiscal support from the private sector--corporations, industry, and the business community

2. Greater emphasis on funding from state aid

3. Less emphasis on funding from federal aid

4. Less emphasis on funding from property taxes

5. More emphasis on direct funding to individuals through a voucher system

Futuristic Trend

Probability			Time Frame			Impact		
Round	Your	New	Round	Your	New	Round	Your	New
2	Rating	Rating	2	Rating	Rating	2	Rating	Rating
Average Round			Average Round			Average Round		
2			2			2		

Curriculum: In the year 2035, major changes in curriculum of the public secondary school will be as follows:

1. Greater emphasis on foreign language competency
 2. Greater emphasis on communication skills
 3. Greater emphasis on humanities and a liberal arts education
 4. Greater emphasis on a core curriculum stressing basic skills
 5. Greater emphasis on computer related skills
-

Futuristic Trend

Probability			Time Frame			Impact		
Round	Your	New	Round	Your	New	Round	Your	New
2	Rating	Rating	2	Rating	Rating	2	Rating	Rating
Average Round			Average Round			Average Round		
2			2			2		

Curriculum (Continued): In the year 2035, major changes in curriculum of the public secondary school will be as follows:

6. Greater emphasis on performance competency
7. Less emphasis on formal curriculum
8. Less emphasis on a formal school steering
9. More emphasis on home-based instruction
10. More emphasis on self-directed, self-initiated learning

Futuristic Trend

Probability			Time Frame			Impact		
Round	Your	New	Round	Your	New	Round	Your	New
2	Rating	Rating	2	Rating	Rating	2	Rating	Rating
Average Round			Average Round			Average Round		
2			2			2		

Student Characteristics: In the year 2035, major changes in the characteristics of the student body of the public secondary school will be as follows:

-
1. Student age will remain the same

 2. Student learning capacity will be greater

 3. Greater emphasis on artificial intelligence and chemical enhancements to improve learning

 4. Age will not be restrictive in the learning environment. General age groupings will occur, but not as restrictively as today

Futuristic Trend

Probability			Time Frame			Impact		
Round 2	Your Rating	New Rating	Round 2	Your Rating	New Rating	Round 2	Your Rating	New Rating
Average Round 2			Average Round 2			Average Round 2		

Student Characteristics (Continued): In the year 2035, major changes in the characteristics of the student body of the public secondary school will be as follows:

-
5. Students will be more emotionally mature

 6. Students will be more job oriented clients

 7. A student body will not exist because there will be no public secondary school

Futuristic Trend

Probability			Time Frame			Impact		
Round	Your	New	Round	Your	New	Round	Your	New
2	Rating	Rating	2	Rating	Rating	2	Rating	Rating
Average Round			Average Round			Average Round		
2			2			2		

Technology--Administration:

In the year 2035, major changes in technology as it relates to administration of the public secondary school will be as follows:

1. Greater emphasis on use of computers and information storage and retrieval systems for administrative purposes
 2. Greater emphasis on computer handling of clerical duties normally handled by teachers
-

Futuristic Trend

Probability			Time Frame			Impact		
Round	Your	New	Round	Your	New	Round	Your	New
2	Rating	Rating	2	Rating	Rating	2	Rating	Rating
Average Round			Average Round			Average Round		
2			2			2		

Technology--Instruction: In the year 2035, major changes in technology relating to instruction will be as follows:

1. Greater emphasis on use of computers in the classroom
 2. Greater emphasis on information storage and retrieval of information electronically
 3. Greater emphasis on electronic libraries, paperless classrooms, and vidoediscs
 4. Greater emphasis on teachers using computers to monitor instruction
-

Futuristic Trend

Probability			Time Frame			Impact		
Round	Your	New	Round	Your	New	Round	Your	New
2	Rating	Rating	2	Rating	Rating	2	Rating	Rating
Average Round			Average Round			Average Round		
2			2			2		

Technology--Instruction

(Continued): In the year 2035, major changes in technology relating to instruction will be as follows:

-
5. Greater emphasis on individualized instruction

 6. Greater emphasis on home learning via electronic delivery systems

Futuristic Trend

Probability			Time Frame			Impact		
Round	Your	New	Round	Your	New	Round	Your	New
2	Rating	Rating	2	Rating	Rating	2	Rating	Rating
Average	Round		Average	Round		Average	Round	
	2			2			2	

Personnel--Administration:

In the year 2035, major changes in the administrative personnel of the public secondary school will be as follows:

1. Greater emphasis will be placed on the principal being more involved with the business community
 2. Greater emphasis will be placed on the principal as leader or coordinator of learning and instruction
 3. Principal will be more of a business manager whose job will be to effectively maintain the learning center/learning systems
-

Futuristic Trend

Probability			Time Frame			Impact		
Round	Your	New	Round	Your	New	Round	Your	New
2	Rating	Rating	2	Rating	Rating	2	Rating	Rating
Average Round			Average Round			Average Round		
2			2			2		

Personnel--Administration
(Continued): In the year 2035, major changes in the administrative personnel of the public secondary school will be as follows:

4. Greater emphasis will be placed on differentiated staffing
-

Futuristic Trend

Probability			Time Frame			Impact		
Round 2	Your Rating	New Rating	Round 2	Your Rating	New Rating	Round 2	Your Rating	New Rating
Average Round 2			Average Round 2			Average Round 2		

Personnel--Instruction: In the year 2035, major changes in instructional personnel will be as follows:

1. Greater emphasis will be on the teacher as an instructional leader

2. Greater emphasis will be placed on teachers being able to work with assistance from computers and other teaching machines

3. Greater emphasis will be placed on teams of analysts, data specialists, and clerical aids who will work with students

4. Teachers will be better paid

Futuristic Trend

Probability			Time Frame			Impact		
Round	Your	New	Round	Your	New	Round	Your	New
2	Rating	Rating	2	Rating	Rating	2	Rating	Rating
Average	Round		Eaverage	Round		Average	Round	
	2			2			2	

Personnel--Instruction

(Continued): In the year 2035, major changes in instructional personnel will be as follows:

-
5. Teachers will be better prepared before entering the classroom
-

Respondent Name

APPENDIX D

1515 S. Jeff Davis
#1319
Arlington, VA 22202
June 21, 1985

RESULTS OF THE STUDY--POSSIBLE FUTURES FOR THE PUBLIC
SECONDARY SCHOOL

This is the fourth and final mailing which includes the results of my study and a list of the people with whom you have been participating in the "round table discussion."

As you recall, my study involves a series of conjectures concerning the public secondary school in the year 2035. In Round 3 you were asked to compare your estimates for each futuristic trend with the group average. After comparing your estimate you were then asked to reassess each futuristic trend and change your own estimates for any trend for which you felt your previous estimate was inaccurate.

These revised estimates were then compiled and the averages were determined for each futuristic trend concerning the probability of occurrence, the probable time of occurrence, and the impact on the public secondary school as we know it today. These final results are enclosed along with a list of my Select Panel of which you were a very special part.

Page 2

Thank you for taking your valuable time to participate in my study as a member of my panel of experts. Your interest and support have been sincerely appreciated. I wish you the very best in "your future."

Linda M. Combs

Enclosures: Results of the Study

Round Table Discussion Participants

POSSIBLE FUTURES FOR PUBLIC SECONDARY SCHOOLS

Results of the Study

In the column entitled "Futuristic Trends," the component heading and definition for each section were provided. The statement directly under the component heading served as a prefix for each numbered item in that section.

For example: Fiscal Support: In the year 2035 major changes in the fiscal of the public secondary school will be greater emphasis on fiscal support from the private sector--corporations, industry, and the business community.

The average estimates of how likely changes are to occur were listed in the column entitled "Probability." The following symbols were used:

- A--almost certain to occur, 90% chance or greater
- H--high probability of occurrence, 60-89%
- E--an even chance of occurring or not occurring, 40-59%
- L--low probability of occurrence, 10-39%
- N--almost no likelihood of occurrence, 9% chance or less

The average estimates for the years the changes will most likely occur were listed in the following intervals under the column entitled "Time Frame."

1985-2000

2000-2020

2021-2035

2035+

The average estimates indicating the impact of the change on public secondary schools were listed in the column entitled "Impact," using the following scale:

+3--a very strong positive impact

+2--a strong positive impact

+1--a mild positive impact

0--no impact, either positive or negative

-1--a mild negative impact

-2--a strong negative impact

-3--a very strong negative impact

Probability	Time Frame	Impact
-------------	------------	--------

Futuristic Trend

Fiscal Support: In the year 2035, major changes in the fiscal support of the public secondary school will be as follows:

1. Greater emphasis on fiscal support from the private sector--corporations, industry, and the business community
2. Greater emphasis on funding from state aid
3. Less emphasis on funding from federal aid
4. Less emphasis on funding from property taxes
5. More emphasis on direct funding to individuals through a voucher system

H	1985-2000	+2
H	1985-2000	+2
E	1985-2000	-2
E	1985-2000	-1
E	2000-2020	0

Probability	Time Frame	Impact
E	2001-2020	+1
H	2001-2020	+2
E	2001-2020	+1
A	2001-2020	+2
H	2001-2020	+1
H	1985-2000	+1
L	2021-2035	-2

Futuristic Trend

Student Characteristics: In the year 2035, major changes in the student body of the public secondary school will be as follows:

1. Student age will remain about the same
2. Student learning capacity will be greater
3. Greater emphasis on artificial intelligence and chemical enhancements to improve learning
4. Age will not be restrictive in the learning environment. General age groupings will occur, but not as restrictive as today
5. Students will be more mature emotionally
6. Students will be more job oriented clients
7. A student body will not exist because there will be no secondary school

	Probability	Time Frame	Impact
1. Greater emphasis on foreign language competency	H	1985-2000	+2
2. Greater emphasis on communication skills	H	1985-2000	+2
3. Greater emphasis on humanities and a liberal arts education	H	1985-2000	+2
4. Greater emphasis on a core curriculum stressing basic skills	H	1985-2000	+2
5. Greater emphasis on computer related skills	A	1985-2000	+2
6. Greater emphasis on performance competency	H	1985-2000	+2
7. Less emphasis on formal curriculum	L	2001-2020	0
8. Less emphasis on a formal school setting	E	2001-2020	0

Futuristic Trend

Curriculum: In the year 2035, major changes in curriculum of the public secondary school will be as follows:

1. Greater emphasis on foreign language competency
2. Greater emphasis on communication skills
3. Greater emphasis on humanities and a liberal arts education
4. Greater emphasis on a core curriculum stressing basic skills
5. Greater emphasis on computer related skills
6. Greater emphasis on performance competency
7. Less emphasis on formal curriculum
8. Less emphasis on a formal school setting

Probability	Time Frame	Impact
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Futuristic Trend

Curriculum (Continued): In the year 2035, major changes in curriculum of the public secondary school will be as follows:

9. More emphasis on home-based instruction
10. More emphasis on self-directed, self-initiated learning

E	2001-2020	0
H	2001-2020	+3

Probability	Time Frame	Impact
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Futuristic Trend

Personnel--Instruction: In the year 2035, major changes in instructional personnel will be as follows:

1. Greater emphasis will be placed on the teacher as an instructional leader
2. Greater emphasis will be placed on teachers being able to work with assistance from computers and other teaching machines
3. Greater emphasis will be placed on teams of analysts, data specialists, and clerical aids who will work with students
4. Teachers will be better paid
5. Teachers will be better prepared before entering the classroom

H	1985-2000	+2
A	1985-2000	+3
H	2001-2020	+2
H	1985-2000	+3
H	1985-2000	+3

Probability	Time Frame	Impact
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Futuristic Trend

Personnel--Administration: In the year 2035, major changes in the administrative personnel of the public secondary school will be as follows:

1. Greater emphasis will be placed on the principal being more involved with the business community
2. Greater emphasis will be placed on the principal as leader or coordinator of learning and instruction
3. Principal will be more of a business manager whose job will be to effectively maintain the learning center/learning systems
4. Greater emphasis will be placed on differentiated staffing

H	1985-2000	+2
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H	1985-2000	+2
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E	2001-2020	+1
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H	1985-2000	+2
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	Probability	Time Frame	Impact
1. Greater emphasis on use of computers in the classroom	A	1985-2000	+2
2. Greater emphasis on information storage and retrieval of information electronically	A	1985-2000	+3
3. Greater emphasis on electronic libraries, paperless classrooms, and videodiscs	H	1985-2000	+2
4. Greater emphasis on teachers using computers to monitor instruction	H	1985-2000	+2
5. Greater emphasis on individualized instruction	A	1985-2000	+3
6. Greater emphasis on home learning via electronic delivery systems	E	2001-2020	+1

Futuristic Trend

Technology--Instruction: In the year 2035, major changes in technology relating to instruction will be as follows:

1. Greater emphasis on use of computers in the classroom
2. Greater emphasis on information storage and retrieval of information electronically
3. Greater emphasis on electronic libraries, paperless classrooms, and videodiscs
4. Greater emphasis on teachers using computers to monitor instruction
5. Greater emphasis on individualized instruction
6. Greater emphasis on home learning via electronic delivery systems

Probability	Time Frame	Impact
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Futuristic Trend

Technology--Administration: In the year 2035, major changes in technology as it relates to administration of the public secondary school will be as follows:

1. Greater emphasis on use of computers and information storage and retrieval systems for administrative purposes
2. Greater emphasis on computer handling of clerical duties normally handled by teachers

A	1985-2000	+3
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A	1985-2000	+3
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APPENDIX E

SELECT PANEL OF EXPERTS

1. T. H. Bell, former Secretary of United States Department of Education.
2. Gordon Cawelti, Executive Director, Association of Supervision and Curriculum Development.
3. Anne Campbell, former member of the National Commission on Excellence in Education and former Commissioner of Education, State of Nebraska.
4. Christopher Dede, professor, University of Houston at Clear Lake.
5. LeRoy Hay, former Teacher of the Year.
6. Paul Houston, Superintendent of Schools, Princeton, New Jersey.
7. Don Glines, Director, Educational Futures Projects, Sacramento, California.
8. Floretta McKenzie, Superintendent, District of Columbia Public Schools.
9. Shirley McCune, editor of Learning Trends Reports.
10. John Naisbitt, author of Megatrends.
11. Samuel Sava, Executive Director, National Association of Elementary School Principals.
12. Harrison Schmitt, former Senator, former astronaut.

13. Harold Shane, author, professor, and former President of the World Future Society.
14. Albert Shanker, President, American Federation of Teachers.
15. Thomas Shannon, Executive Director, National School Boards Association.
16. Scott Thompson, Executive Director, National Association of Secondary School Principals.

APPENDIX F

SELECTED COMMENTS FROM MEMBERS OF THE PANEL OF EXPERTS

- Education will be funded almost totally from the state level.
- Parent involvement and local neighborhood authority and control will be strengthened.
- Teachers will be required to be better educated; graduate degrees and constant advanced study will be necessary.
- Electronics, artificial intelligence, bookless and paperless schools will be common.
- Students will be analyzed intensely. Much more will be known about the brain and how it handles information. We may even have "get smart" pills.
- School will be heavily home-based, electronically managed, and much more individualized.
- The formal school setting will likely be very different from today.
- There will be development of some newer and more appropriate roles or instructional expectations for the schools.
- Students will be taught to better deal with stress, ambiguity, data banks, synthesizing.
- More attention will be devoted to perfecting a free society and cooperating/collaborating with other nations.
- Public secondary school is likely to end at the sophomore year.

- Community service or national service may occupy some time in a student schedule each day.
- School buildings will become coordinated learning centers.
- Schools of tomorrow will be almost unrecognizable--much different from today's schools.
- Schools will be more flexible.
- Schools will be less central to student learning experiences. Other parts of society will also do teaching.
- The impact of the anticipated changes in society and education will be the elimination of the public secondary school.
- The American secondary school will truly go the route of the dinosaur by 2035, an interesting historic relic.
- Schools will be more dependent on flow of information.
- Students will have to be better communicators.
- Students will be treated more as individuals.
- Schools will move toward meeting the needs of adults and many other nontraditional clients.
- Training and education will be interrelated.
- Schools of the future will be open many more hours each day.
- Schools will become more result oriented.
- An extremely important impact will evolve in values education.
- Private industry will become a committed partner in the schooling effort.
- Greater equity will exist for students in terms of having access to a productive learning environment.

- Schools will be better managed.
- Students will be a better informed generation.
- Changes in curriculum will lead to intellectualization of students and teachers.
- Schools will be more in tune with the community.
- Year-round schools will be commonplace.
- The current concept of the comprehensive large high schools will "go by the boards."

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