

Success in the Information Age: A Paradigm Shift

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There's nothing like a dream to create the future. Utopia today, flesh and blood tomorrow.-
-Victor Hugo

Life is either a daring adventure or nothing.--Helen Keller

These two quotations summarize the main ideas addressed in this paper. To paraphrase Victor Hugo, we are the creators of our future. However, there are forces and factors in our environment today that we do not control, but that are pushing and prodding us to change if we want to be successful. Even though these powerful economic and societal forces are creating different criteria for success in the 21st century, our schools are not making corresponding modifications (e.g., Robinson, 1992). How we act or respond is still up to us. We are the ones that control our responses. We made our past. We have made our present. We will make our future. And if we want to have some control 10 or 15 years from now, we need to make some changes today.

I believe the "daring adventure" Helen Keller spoke of is going to be our common experience over the next 10 to 15 years. The path we are walking is not well marked and difficult to traverse. Unfortunately, we are going to need to travel it at breakneck speed if we are to be successful. And also, unfortunately, some of us are not going to do as well as we would like. I believe we can make some good predictions about the knowledge, attitudes, and skills of people who are more likely to traverse it safely and even improve their personal and socioeconomic conditions in the process. They are the ones who are looking at the trends and making appropriate adjustments in their daily lives.

Thomas Kuhn (1962), in a book titled "The Structure of Scientific Revolutions" discussed the importance of a powerful concept: [paradigm](#). He said that scientific paradigms are "accepted examples of actual scientific practice-- examples which include law, theory, application, and instrumentation [meaning measurement instruments and procedures] together that provide models from which spring particular, coherent traditions of scientific research. [People] whose research is based on shared paradigms are committed to the same rules and standards for scientific practice."

With the change of a few words, it is evident that this is an important concept for educational reform. "[Educational] paradigms are accepted examples of actual [educational] practice-- examples which include law, theory, application and instrumentation together that provide models from which spring particular, coherent traditions of [educational] practice and

[educational] research. [People] whose research is based on shared paradigms are committed to the same rules and standards for [educational] practice."

As social institutions, school systems, along with families, religious organizations, and communities, bear primary responsibility for providing young people with paradigms that will allow them to be successful in our society (Huitt, 1999a). Just by looking at the relative standard of living in the U.S., it is evident that these institutions worked well for much of this century (e.g., Bennett, 1993). However, the paradigm for success is rapidly changing. Unfortunately, those responsible for guiding and operating these institutions have not paid enough attention to this change; we are still operating as if the old paradigm continues to work. The purpose of this paper is provide some concrete evidence about how that paradigm has changed and provide some ideas about how educators can respond.

Another definition of paradigm is provided by Joel Arthur Baker (1992) in "Paradigm: The Business of Discovering the Future." Baker's expertise is in looking at paradigms of organizations and helping them to restructure their ways of thinking so that they can more adequately cope with the future. He defines a paradigm as "a set of rules and regulations (either written or unwritten) that does two things: 1) it establishes or defines boundaries and, 2) it tells you how to behave inside the boundaries in order to be successful."

The example of Bjorn Borg, the great tennis player, provides an example of how a paradigm change works. At the time Borg was playing he used a wooden racket, just like everyone else. He retired and then came back several years later after all the tennis players started using more powerful rackets. They beat him to a pulp. He knew the rules of tennis. He still had the strokes. But the context, and consequently the rules for success, changed in that a more powerful racket was used and Borg was never successful again. It may have been that he was a still "better" tennis player, but he could not adjust to the new paradigm and he was therefore unsuccessful. That is what is going on today.

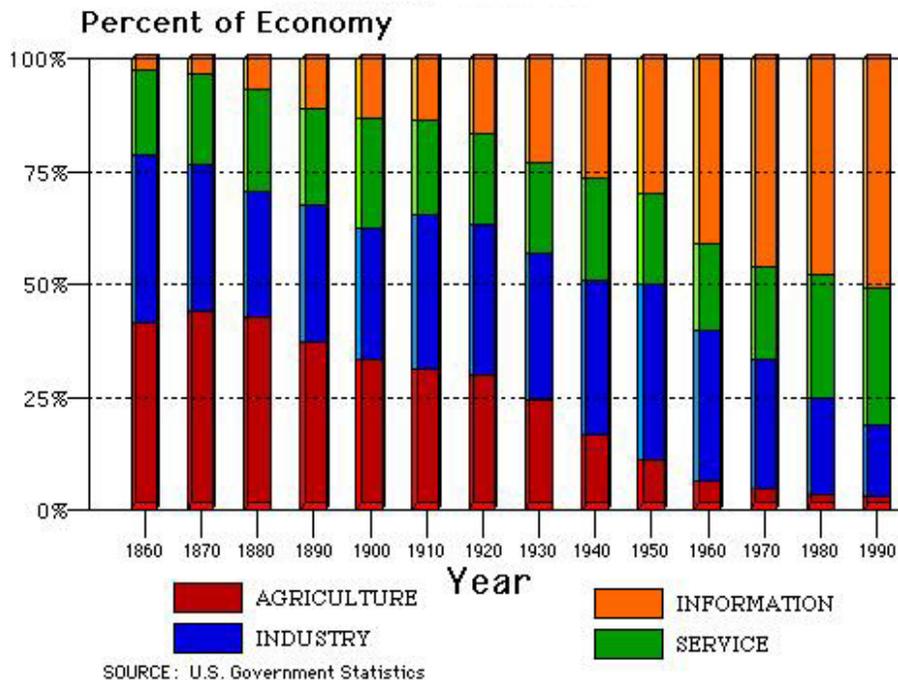
Movement to the Information Age

We are undergoing the most [significant change ever experienced in human history](#). We have moved from the agricultural age through the industrial age and into the information age in a span of just 100 to 200 years (see Figure 1). We have lived most of our human history in the hunter/gatherer age. In that environment the person with the best way to kill an animal or select the correct items to eat was most successful; in the agriculture age, the person with the most land and best agricultural machinery was most successful; and in the industrial age the person with the best manufacturing process or the most capital was most successful. Who will be most successful in the information age? Toffler (1990) believes it will be the individual, group, community, society, or nation that has access to information and the ability to process it. He states that knowledge is the central aspect of today's society. I will discuss a few points about the process of this change and then provide some specifics regarding the implications of those changes.

In 1982, Naisbitt wrote a book called "Megatrends." In 1990, Naisbitt and Aburdene wrote "Megatrends 2000," followed by "Megatrends for Women" in 1992 by Aburdene and Naisbitt.

These were followed in 1994 by "Global Paradox." Every educator ought to have an idea of the major concepts presented in these books. One of the megatrends identified by these authors is one I just presented: the movement from an industrial to an information society. In 1980, the United States produced approximately 25% of the world's industrial production. This was accomplished with only 5% of the world's population and a decreasing proportion of that was involved in manufacturing. It is not that production is declining; it is the industrial workforce that is declining.

Figure 1. Movement from the Agricultural/Industrial to the Information Age



The movement from the agricultural to the industrial to the information age was also discussed in great detail by Toffler in "The Third Wave" (1981). If one rereads this book today, 15 years after it was published, it is amazing how accurate Toffler was.

Toffler's 1990 book, "Powershift," continued the discussion of the impact of the information age. In the past, social change has been controlled primarily through force (i.e., military) or the market (i.e., money). Toffler states that today knowledge is the key to power: "The control of knowledge is the crux of tomorrow's worldwide struggle for power in every human institution. He who controls access to knowledge has power." (p. 20) From this perspective, education and access to information become equivalent to the importance of having access to guns and money for earlier generations. Toeffler's latest book ([Toeffler & Toeffler](#), 1995) provides an excellent overview of his 30 years of work in this area.

How many educators have a home computer with a modem? In general, I have found some 10-30% of any given group of educators will have that equipment (1999 update: approximately 80%). And yet almost any individual with the proper equipment can access the world through the

Wide World Web and the Internet for as little as \$20 a month. And if one is a student, staff or faculty at an educational institution it can be done at no additional expense. I can get on my computer at my office or home anytime, day or night, and electronically go any place in the world. My wife walked in the room one time while I was completing a library search. When she found out I was on-line with Australia she almost died (or I almost died). I very quickly told her not to worry, it was a local call. But one has to have access to the equipment and some knowledge in order to take advantage of this opportunity. To the extent that an educator is not now using the Internet and more specifically, the Wide World Web, he or she is falling behind in the power struggle that is currently taking place.

Other Trends

The Importance of Technology and the Speed of Change

This leads to a second major trend in today's society, the importance of technology and the speed of change. Paul Zane Pilzer, in his 1990 book titled "Unlimited Wealth" states that technology has always been the most important factor in an economy, but the speed with which new technology is being introduced today has focused our attention on it. In 1970, Toffler, in "Future Shock," described the process of change, how change comes about, and how it effects people in organizations. He defined future shock as "a disorientation and stress brought about by trying to cope with too many changes." A good example can be seen in agriculture. In the 1930's some 30 million people were involved in farming. They grew enough food to feed about 150 million people. Today there are only about 3 million people involved in farming (and that number is declining every year). This much smaller number of farmers grow enough food to feed a population of 250 million in the US and export enough to feed another 100 million. How did this happen? I have a friend who as a child helped his father on the family farm in the 1950's. His dad had 30 sets of mules and 60 families to farm a certain amount of acreage. Just before he went bankrupt, as many farmers have done in the past several years, my friend was farming more acreage by himself with the help of two men and a lot of equipment than his dad had done with the help of 60 families.

Technology was applied to the process of farming and dramatically changed everything that was going on. And where did the people go who left farming during the past 60 years? Most went into the manufacturing sector, at least initially. Pilzer (1990) describes some changes that are taking place in manufacturing. In 1990, the U.S. economy produced about 3 times the amount of goods produced just after World War II with about the same number of workers. And there have been tremendous shifts in the manufacturing sector, too. For example, how many people own phonographic records? I have a whole collection. My 19-year-old-sons have none. They have tapes and CDs. My generation seldom bought tapes because they distorted the music and did not last very long. However, the new tapes are great and the CDs deliver unbelievable quality. And the new digital tapes give the same quality of sound as CDs, but in a recordable format.

But look at the speed of change in these two industries. It took 50 to 60 years for farmers to make the shift into industrialization: making records, making cars, making stuff. In the music industry in 1980 everybody was making phonographs. What happened in 1985? CDs came in and wiped out that industry. What took fifty years to do for agriculture, took five years to do for

phonographic records. Now the music industry as a whole did fine. But the people who made records in Ohio did not make the shift to making CDs in California. And all the people who supported the record industry in Ohio had to make changes, too.

Another example provided by Pilzer (1990) occurred in 1970, for those of you who are a little older. Remember the gas crisis and being told that we had 40 years left of oil and gas. In 1990, just 20 years later, we ought to have twenty-one years left of fuel, right! Wrong! We have 90. What happened? More oil reserves. We started drilling ten miles deep instead of five miles deep. We figured out how to get the oil from places like the oil fields of Alaska. And we also figured out how to conserve the oil we do have. We learned how to power automobiles with fuel injectors instead of carburetors and doubled the gas mileage of cars. This completely restructured our thinking about fuel. In less than 20 years our whole idea about fuel reserves changed. And it also changed other industries. People who used to build and repair carburetors are out of work. Now you take your car to the shop and the mechanic plugs it up to a computer. The computer tells him or her what chip is malfunctioning, the chip is removed, the fuel injector is put back together and the mechanic gives you a bill. WOW! It's kind of like the guy who could not get his car started and this mechanic walks up and says he can fix it. He looks under the hood and fiddles with the engine. He then takes out his hammer and goes, WHACK and says "Try it now." The car starts right up, and the mechanic says, "That will be a hundred dollars." The car owner says, "A HUNDRED DOLLARS!" The guy says, "Yeah, one dollar for whacking the engine and ninety-nine dollars for knowing where to whack it." That's the whole idea here. The knowledge of what to do is worth more than the specific action. However, the action has to be taken or the knowledge is not worth very much.

What's happening now? Can you imagine that change taking 50 years in our parents' lifetime will take 5 years or less today? How many people have brothers and sisters that are five years younger than they are. Have you ever tried to listen to their music? It is different. There is a new generation. I had some students who were talking in class about "dissing" somebody. What is that? They had to teach me a whole new vocabulary. [By the way, it means to show someone disrespect.] But the important point I want to make is that change is going to happen fast. How are we going to keep up? We are all having a very difficult time. That is what Toffler talks about in "Future Shock."

Dent (1998) states that the Internet will be the driving force behind the development of new technologies in the next decade: "Widespread use of the Internet and allied technologies will fundamentally change the way we handle our business at home and at the office" (p. 98). He offers additional detail regarding the changes in manufacturing, distribution, decentralization, and the customized economy discussed below. Dent outlines eight technology trends that will make these other changes possible:

- Vastly expanded computer power
- Mass adoption of portable and home PCs
- Computers evolve into simple, inexpensive appliances
- Microprocessor-embedded home appliance linked with the Internet
- Consumers rapidly move online
- Expansion of communications bandwidth

- Object-oriented programming for customized software
- Increased computer literacy, due to an aging population

Dent suggests that just as we had a first and then second industrial revolution (the 1700s and the early 20th century, respectively), we are embarking on a second information revolution with the introduction of the Internet. Kurzweil (1999) predicts that the increased computational power of computers will allow the development of a desktop computer that has the capacity of a human brain by the year 2020; by 2025 that machine will cost \$1000. It is this increased computer power combined with vastly increased communications bandwidth (presently 28K and 56K moving to 400K to 1500K in the next several years) that will make users move to the Internet. An article in USA Today (June 10, 1999) states that the number of people using the Internet is doubling every 9 months. Another article in PC Magazine (June 22, 1999) states there will be 180 million web-connected Americans in 2002; world wide the figure will be 300 million. That's up from 30 million in 1998.

Manufacturing. Toffler (1981) discussed changes in manufacturing that have resulted from the introduction of technology. One of the most important is called flexible manufacturing. Here is an example of how this has happened in industry. In the late 1980's IBM manufactured microcomputers for which they commanded a premium price. A college student, wanting to make some money, looked through computer magazines and realized he could buy all the pieces to make a comparable computer. He built a few computers for his friends that met their exact specifications. He would get the monitor, the mother board, the computer case, the keyboard, extra memory chips, floppy drives, hard drives, put it together and sell the assembled computer. He made so much money doing that during his college years, he started a business. Today Dell Computers is a major company in the computer industry with a reputation for manufacturing computers to an individual's specifications. That is not the ideal at IBM or Apple. Dell is an industry leader in the area of flexible manufacturing and is showing the rest of us how this idea can be implemented.

Distribution. As important as are the changes in manufacturing for education, the changes in distribution are even more important (e.g., Dent, 1999). There are two reasons for this. The first is that more of our students will be involved in distribution during their working lifetimes than are involved in manufacturing. For example, Paul Zane Pilzer (1995) in his most recent book "God Wants You to be Rich" says that 80% of the retail price of most goods you buy goes to the distribution costs of those goods, while only 20% goes to the manufacturer. And it is his opinion that distribution is where most people will accrue wealth in the next several decades. A quick glance at lists of the wealthiest people in the US confirms this idea. If you looked at the list 50 years ago you would have seen that the owners of gas and oil reserves and the owners of manufacturing plants such as US Steel and DuPont, along with the financiers of those manufacturing businesses, were heavily represented. However, a quick glance today shows that with the notable exception of Bill Gates, who manufactures computer software, most of the remainder of the top 10 or 20 are involved in distribution or the financing of distribution business. And even Bill Gates has been successful because he controls the distribution channels for the software he produces.

The second is that the education industry, by and large, is a distribution industry. Just think about how you spend most of your time. Is it in the production of new knowledge or in its dissemination? And the impact that technology is having on the distribution system is tremendous. But let me discuss this in the context of another major trend: decentralization.

Decentralization. Decentralization is the process of putting the responsibility and authority for making decisions into the hands of the people who will be implementing the decision. In my opinion this is one of the major trends that has yet to hit the educational industry. In fact, we have trends towards centralization.

I want you to name this country. A small group of people, most of whom are not educators, get together, formulate educational goals and educational curriculum and advocate that everybody in the country should answer to those standards. What country does that sound like? Does that sound like the Soviet Union? Sound like China? Sound like USA? That occurred at a governor's conference chaired by then Governor Clinton in 1989. Just as technology is making it possible to put decision making in the hands of people at the local level, we have political leaders at the state and federal level moving in the opposite direction. I believe that as technology makes decentralization in education more feasible, we will move in the direction of less national and state control and more towards local and even parental decision-making. In my opinion, any attempt to centralize control at the national level is bound to fail because it is going against a major social trend. That does not mean there is not a role for a national agenda. It does mean, in my opinion, that while we probably need to have a national research/development and dissemination effort, our educational system will be better reformed by encouraging specific curriculum decisions to be made at the local level.

The customized economy. What does all of this have to do with education? Harry Dent, in his 1995 book titled "Jobshock" points to a trend that he calls "the customized economy." Let me just give you one example. Education today, where everybody comes together in one place and is put through the exact same curriculum, is the last bastion of industrialization. We are not asking students, "What are your skills, what do you need to learn?" We put every student through the same process regardless of each student's individual needs, desires or learning style. Looking at the trends of demassification and decentralization, a process similar to what has occurred in industry could soon begin to occur in education. The technology is already available to do so. Within 5 to 10 years the software to teach the core academic subjects will be available. And with the development of the "information superhighway" that everybody is talking about, we will be able to deliver that content in such a way that anyone anywhere can learn whatever is desired at anytime to any level of competence. When that promise becomes a reality, it will revolutionize how we approach education.

A view of how the concept of the customized economy may impact education is provided by Lewis Perelman (1992) in his book, "School's out: Hyper-learning, the new technology and the end of education." This book should be mandatory reading for every educator. Perelman does a superb job of documenting many of the changes and trends taking place today. He glimpses the future as competently as any of the other writers I have mentioned. But what he sees instead of schools and classrooms with lots of technology such as computers and satellite dishes is education occurring outside of traditional schools--in homes, shopping centers, and so forth.

Perelman (1992) advocates the development of a concept called micro-vouchers. A voucher enables a parent or guardian to take the money normally given to the state-funded, school-board controlled school district and spend that money at any school desired (within some set of guidelines.) A micro-voucher would provide the parent or guardian that same amount of money, but it could be spent on any educational product or services the adult chooses. If the parent decided to buy a computer for educational purposes, the educational money could be spent on that. If it was decided that it would be best to buy a curriculum package, or hire a tutor, purchase the latest CD-ROM on human anatomy, that would also be acceptable. Does that sound unbelievable?

The trends toward demassification and decentralization discussed by Toffler (1981) and Naisbitt (1982) point in this direction. An additional piece of information provided by Pilzer (1990) suggests this might be a possibility. He states that more shopping centers and malls closed than opened in 1989. This is the first time this has occurred in the 35-year history of malls and shopping centers. What are we going to do with all that space? Perelman says we can have classes, we can have dance studios, we can have technology centers, all kinds of educational activities. We will figure out how to use it.

I like the analysis Perelman provides; I just do not agree with his solution. I believe that the microvoucher concept conveys to parents and/or guardians that the education of their children is their choice alone and not a social concern (see Huitt, 1999b). In my opinion, universal education is a social responsibility that we should not simply hand over to people who are capable of producing children. We have created an educational system that, while flawed, is still producing many adults who can take advantage of the movement to the information age.

But the issue of funding and educational choice will continue to be a topic of debate in the coming decade. For example, the state of Georgia in the past legislative session, discussed the issue of school vouchers. Several states have already implemented some sort of voucher system, and school choice is on the ballot in a number of other states. I believe the topic will be revisited in coming sessions. It will also be discussed at the federal level. I believe we are 5 to 10 years away from significant changes in the funding and governance of our educational system. And those changes will lean towards more choice and a more decentralized, flexible approach to delivering educational curriculum.

I hope we have a few well-controlled pilot programs before we make any major changes. I would like to have a discussion of expected educational outcomes and then fund some well-controlled pilot studies to see what happens with different funding alternatives. But is that the way the educational industry operates? Is that the way a state or federal government operates? Not often enough, in my opinion. However, if we are going to make some changes does it not make sense to research those changes? I advocate systematically studying the problem and possible solutions and determining what works best through research and the application of the scientific method rather than make choices through politics. The kind of changes I will advocate might not work in exactly the way I predict they will. I may be wrong. That is to be expected. Your ideas may be better. That's OK. I do not think we should do what Perelman advocates, but I would support a pilot test of his ideas in several communities around the country to see what happens. I highly

recommend that you read Perelman's book. I think that at least you will be informed of a proposal that is on one end of the spectrum of ideas about educational reform.

Global Economy

A related megatrend that Naisbitt (1982) discussed was a change from a national economy to a multi-national regional and global economy. Throughout the 1900's, the US experienced a change from a local and multi-state regional economy to a national economy. Beginning in the 1940's, when so many people came back from the war, industrial output increased tremendously. We went from a multi-state regional economy to a national economy about that time. Every country in the world wanted to bring its products into the American economy, and still does. Why? We have more people with more money. With only about 5% of the world's population we have somewhere between 25% and 40% of the world's wealth. Even with major countries like Japan and Germany as competitors, we still have tremendous amounts of wealth. But that wealth is becoming more evenly distributed as we compete in the global economy. And we are no longer able to isolate ourselves and our economy. We must increasingly provide world class products if we are to be successful in the marketplace.

Naisbitt (1994) in "Global Paradox" describes a situation he believes will be a focus of the next decade: The bigger the world economy, the more powerful its smallest players. He shows how the telecommunications revolution is fueling this change and how important the entrepreneur will be to the future economy. For example, "50% of the U.S. exports are created by companies with 19 or fewer employees; the same is true of Germany." (p. 6) And it is the effectiveness and efficiency of these individuals which will fuel our economy and dictate our lifestyles. One implication of this is that educators, who for the most part have never had entrepreneurial experience, will be required to develop the knowledge, attitudes, and skills of individuals who can provide this vital function. How will this get done? I am not certain that anyone has the specific solutions, but it certainly will require some significant changes in how we operate formal learning opportunities.

Dejobbing of Workforce

Temporary full-time and permanent part-time. Toffler (1981) also predicted the spread of part-time work. Has anybody been shopping at Sears lately? Is it difficult to find someone to help you? The same goes for Penny's, Wal-Mart, Kmart and other major outlet stores. I worked at Sears during college in the 1960's. It was one of the best places to work when I was there because if you worked part-time through college, you likely would have the opportunity to move into a department manager's position when you graduated. It was kind of like interning. That is not the story today, not at all. In any given Sears store there will probably be only two or three full-time people on the floor at any one time. There will be 20 or 30 part-time salespeople. Why do companies hire more part-time people today? A major reason is that they do not have to pay benefits. In most businesses payroll is a major expense and health benefits are a major part of that. And so companies are figuring out how to reduce that expense. Jeremy Rifkin (1994) in his book "The End of Work" states that in the early 1990's some 35% of the workforce was either temporarily employed or underemployed (working less than full-time). And this is a trend that

will likely continue. It is predicted that somewhere around the year 2000 some 50% of the workforce will be in the temporarily employed or underemployed category.

Entrepreneurship and home-based business. Toffler (1981) also discussed a shift of work back to the home. In 1900, something like 70% of us worked for ourselves; in the 1970's some 6% worked for ourselves. Toffler predicted that to change and in 1990, approximately 24% had at least one source of income that was derived from an entrepreneurial effort. It seems that he was right on target. By the year 2000, William Bridges (1993) in "JobShift" predicts that 50% of all the homes in the United States will have a home-based business. We can see that this trend is largely in response to the employment trend. People are starting their own businesses basically for survival. It's not "Oh, yes, I want to have a home business." People want to work, to make a living, to put food on the table. A person can work 20 hours at a place of regular employment, but had better have something to do beyond that because the jobs just are not there. Bridges says we all need to think of ourselves as a business, as "You, Inc." The government and large corporations who have provided jobs to take up the employment shifts in the past are simply not going to do that in the future.

There is a lot of support for the validity of these trends. For example, the American Vocational Association (1984), in a report entitled "Adults in the Changing Workplace," discussed how the American economy is shifting to a service and information economy. They predicted that 15 million jobs in manufacturing would become obsolete in the 1980's. The actual number was about 20 million. However, they failed to predict that close to the same number of white collar jobs would also become obsolete. This is highlighted in the different approaches that Sears and Penney's took to remain competitive in the 1980's. Penney's decided to relocate to Texas and they offered a 2-years bonus to anybody who would not move. They moved about 20% of their employees, but never completely restaffed. Their sales for the next year went up over a billion dollars. Sears, a larger corporation, was enticed to stay in the Chicago area. They moved just outside of Chicago where most of the executives lived. Very few people were actually let go and their sales went down almost a billion dollars and they closed their catalog operation a few years later.

What's going on here? Companies are finding ways to do more with fewer people by using technology. And if we understand that this is a global process, not just affecting any single company or any single industry or any single individual, then we as educators ought to be able to make some adjustments to help our young people better prepare for the future. The economy is becoming more technical and will demand higher level skills. Very few opportunities will be created for those who cannot read, follow directions and use mathematics or the basic skills. So basic reading and math skills are necessary. It is just that they are not sufficient.

Naisbitt and Aburdene (1990) cite statistics from the U.S. Department of Labor stating that 75% of the workforce for the year 2000 was already in place in 1984. The information and service sectors are accounting for the vast majority of the new jobs and currently employ at least two-thirds of the total workforce. According to Dent (1995), it looks like that number is climbing to approximately 87% of the total workforce. It is very important that we as educators understand we must prepare young people to go into an economy where most of the available jobs are already filled and that the few new jobs created will be mainly in the information and service

sectors. Only about 13% of the workforce will be will employed in manufacturing or farming/agriculture.

Another important piece of information related to jobs is connected to the issue of immigration. For the 1980's the U.S. created more jobs than all of Europe and Japan combined (Naisbitt & Aburdene, 1990). As hopeful as that sounds the fact is that during that same time period, the U.S. annually admitted approximately 650,000 legal immigrants, more than all other countries combined (Naisbitt & Aburdene). This continues a trend that has been in place for the past 20 years. What this means is that our people not only have to compete for jobs in areas that the educational system may not be preparing them for, but they also have to compete with the best that the rest of the world has to offer. Our companies are competing in a global economy. Our lifestyle--the things we do, the things we have, how we travel, and so forth--depend on our nation having these qualified workers. Why can we let so many people into the country? Because qualified people in the US do not have the skills that are needed. That is the main way legal immigrants can come into the country. What is that saying? Business and industry are producing the jobs. These jobs must be filled by people who are capable of working at world class standards or those companies will not remain competitive and they will go out of business. But we as educators are not producing the qualified people to take those jobs and those businesses must go outside this country in order to do that. Does that sound alarming? Does that sound like a wakeup call?

Institutional-help to Self-help

Another trend discussed by Naisbitt (1982) is the trend away from institutional help and toward self help. What was George Bush's answer to the problems with our educational program? [Goals 2000](#). Six goals that all communities could work on. And while those may have been important goals to work on, unfortunately, he did not develop a national infrastructure (with appropriate funding) to assist in the development of local plans. But we certainly moved away from a focus on institutionalized help. Another example is the discussion of what to do about health care. What was the main idea behind President Clinton's healthcare proposal? Centralization, federal-control. And Congress failed to pass it. The solutions being discussed today are much more flexible and put more decision-making into the hands of the consumer. If one has a paradigm that includes an understanding of some of these trends, alternatives and solutions can be judged accordingly. Of course, this is not to say that every solution will follow the trend, but one should certainly be aware of these as decisions are made.

Multiple Options

One final trend I would like to highlight is the concept of multiple options. This is the tendency to acknowledge there is no one "correct" way to do things and, in fact, we may have to combine multiple alternatives in order to achieve a successful solution. One example of multiple options is in the area of media. During the 30's and 40's most people got information about current events through the radio or newspapers. In the 60's and 70's television became more important and the relative importance of radio and newspapers decreased. But how many channels did you have in 1980? Three major channels and maybe 5 or 6 more. How many channels do viewers have available today in major markets like Atlanta, Savannah, or Jacksonville? On the cable you can

get 70, 80, 90? And that is just in 20 years. You can sit on your couch and click, click, click, all night long. Naisbitt predicted that in 1982. But with the new 18" satellite dishes and satellite cable companies you can access 200, 300, or 400 channels. The programming is broadcast as a digital signal, the same type of signal that revolutionized the music industry with the introduction of CDs.

Summary

In 1990, Naisbitt and Aburdene extended Naisbitt's (1982) previous presentation by highlighting some additional trends. For example, they affirmed the movement to a global economy and anticipated a global economic boom in the 1990's similar to that described by Pilzer (1990) in "Unlimited Wealth." This would be accomplished through world-wide adoption of the free market system and the rise of nations associated with the Pacific Rim. They also presented evidence of a coming renaissance in the arts and a revival of [religion](#). They foresaw a rise of women in leadership positions (see [Huitt](#), 1998) which they described in more detail in Aburdene and Naisbitt (1992). Another trend that is becoming increasingly important, especially for educators, is the increasing diversity of our population and the likelihood that many of our major population centers will become majority-minority within the next several decades.

In "[Creating a New Civilization](#)," the Tofflers (1995) elaborate on the theme discussed in "The Third Wave" and describe a total change of society as we know it. They elaborate on some of the themes such as the demassification of society, just-in-time manufacturing, and the need for flexibility and adaptability. This is probably the book to read if a person has only enough time to read one.

Skills Needed

Chance (1986, as cited in SCANS, 1991) developed a list of skills and attitudes needed for the agriculture/industrial age of the 19th and early 20th century:

- Punctuality (Get to class before the bell rings because if you do not you will be tardy.)
- Follow instructions (Pay attention when I am lecturing; you should be taking notes.)
- Recognize the authority of the supervisor (That's me. Be quiet so that I can talk.)
- Work on monotonous tasks for a long period of time (like from 8:30 in the morning to 3:30 in the afternoon).

Does this describe most of our current classrooms today? Does this describe the paradigm of what we are doing in our schools today? Does our paradigm of being successful in school require these qualities? The students may not be behaving in this way, but the current paradigm apparently says they ought to.

What are some of the skills needed to be successful in the 21st century? I reviewed the writings of a number of authors who discussed issues relating to [being successful in the information age](#). I have listed these [characteristics of success](#) in alphabetical order. An argument can probably be made that each of these qualities is most important. But let me make a case for three: [information processing skills](#), [communication skills](#) and [character](#). The issues of information processing and

communication become absolutely critical in an information society. In general, we talk about three parts of the communication process. First, there is the person that sends the message; second, the message itself; and third, the person who receives the message. Information processing skills become important because they provide the major influence on how the message is formulated. Communication skills are important because they provide the avenue by which the message is delivered. Character is important because if the person is not of good character, if he or she cannot be trusted or is perceived as not being responsible, it does not make very much difference how good the message is or how well it was transmitted. If the person has excellent communication and information skills, but cannot be trusted, then the message will not be accepted. Therefore, if the educational system were to focus on the development of information processing skills, communication skills, and character, students would be at least minimally prepared to be successful in the information sector of the economy.

Another view of important knowledge, skills and attitudes that will be required for success in the information age is found in the [SCANS](#) (Secretary's Commission of Achieving Necessary Skills, 1991) report. This document was produced by the Department of Labor in conjunction with business, industry, government and educational leaders from around the country. A summary of the SCANS report is shown in your [handouts](#). [NOTE: [Huitt](#) (1997) wrote a critique of the SCANS report and suggested some necessary revisions.]

Developing a New Paradigm

I believe the books listed on the [last page](#) of your handout, and especially the SCANS report, provide a foundation for thinking about a world view paradigm that will describe being successful in the 21st century. Let me give you an example by discussing "Unlimited Wealth" by Paul Zane Pilzer. Does anybody know who Paul Zane Pilzer is? He is an economist. In fact, he fits my definition of a good economist: he is a millionaire. I prefer not to get economic advice from an economist who has patches sewn on his sleeves. I want my information source on economics to be wealthy, to have the "fruit on the tree."

Pilzer (1990) has developed a paradigm of economics that says there is unlimited wealth. What he says is that wealth is in the mind. Wealth is a product of how we use our minds. There is no such thing as resources and therefore no scarcity of resources. There is only the ability to identify resources or a lack of an ability to identify resources. So, he redefines economics in some very interesting ways. The important issue that I believe we all need to consider from Pilzer is that if his concept is true, if it is true that there is unlimited wealth today, how should we prepare our young people to take advantage of this concept? What should we teach our young people? How does a view of unlimited wealth impact what and how we teach? Should we teach young people in a home economics class to live on \$25,000 a year because that is what most people are trying to do in the US or should we say there are some people living on \$100,000 or \$500,000 or whatever it is that they want to live on, and help them explore the kinds of lifestyles that are available and then help them figure out what they should do to obtain that lifestyle? Should we provide them with the structure of how the majority of people live or should we provide opportunities for them to explore excellence in the economic arena? From this example it should be clear one's paradigm of how the economic world works can make a difference in how one approaches schooling and education?

Another viewpoint on economics is provided by Harry Figgy in his book "Bankruptcy 1995." He has a view that appears to be just the opposite of Pilzer's. Harry Figgy is a wealthy businessman who served on the Grace Commission, a group of 160 businessmen charged by then President Reagan to identify waste in government and get rid of it. As part of the committee's work several predictions were made about the federal debt. Unfortunately, these predictions have been right on target for 10 years.

From the founding of this country through the presidency of John F. Kennedy this country accumulated a federal debt of approximately \$310 billion. During 16 years under the presidencies of Lyndon Johnson, Richard Nixon, Gerald Ford and Jimmy Carter the federal debt grew by an additional \$466 billion. And during the 12 years of the Reagan and Bush administrations the federal deficit grew an astounding \$2.4 TRILLION. The deficit is continuing to climb during the Clinton administration at somewhat the same rate. If you understand something about geometric exponential growth, you see this occurring in terms of the deficit. Figgy predicted that because of the deficit that our federal government will go into bankruptcy which will lead to a bankrupt economy. This collapse will lead to a world economic collapse that will make the 1930's look like a picnic.

Here is an indication we have chaos in the marketplace. When someone can go into a bookstore and find books by reputable authors that say we are living in a time of unlimited wealth and at the same time predict bankruptcy of our economy, this is an indication of tremendous uncertainty. With that range of predictions, it is an indication that confusion is the order of the day.

Now, which of these two views is correct? I want to convey an important concept; a concept directly related to the trend towards multiple options. The answer is YES. There are going to be some institutions and corporations in our society that will disappear practically overnight; there will be others who will use that disappearance as fertilizer and bloom. And I believe we are going to see this topsy turvy economic climate for at least the next 20 to 50 years. It will take minimally this long to get things straightened out as we move into the information age.

What does this have to do with education? It has to do with identifying the critical components of success in this environment and teaching the requisite knowledge, attitudes, dispositions and skills necessary not only for survival but for success. Given the information I have just provided what should our young people be learning? [Get out and stay out of debt](#)? Flexibility in [career choices](#)? [Problem solving skills](#)? What we will need to do is examine some possibilities of curriculum focus for the information age.

[Is Change Needed In Education?](#)

My belief is that if the k-12 school system does not change and if there is continued dissatisfaction with the product of this system, then change will be forced upon us. Educators will be responsible for making the necessary changes from the inside or someone else will do so from the outside. If we, as professionals, do not make the necessary adjustments, then Congress at the national level or the Legislature at the state level will mandate new rules, new regulations and funding changes that will force change upon us. It could be that they force changes in the

teacher training and certification procedure as they did in Texas and New Jersey. It could be that they provide for alternate funding of education as they did in Michigan. But changes will be made.

We are not doing an absolutely horrible job in the schooling industry. More than 75% of our young people graduate from high school, up from less than 10% at the turn of the century. And the more that students are successful in our educational system, the more likely they will be successful in the economy. For example, Naisbitt and Aburdene (1990) report that in 1987 the unemployment rate for college graduates (who accounted for 25% of the U.S. workers) was 1.7%. Workers with one to three years of college (1/3 of all US workers) had an unemployment rate of 3.7%. For high school graduates it was 5.4% and for high school dropouts it was 9.4%. The average for all workers was about 7.8%. Now this does not mean that schooling guarantees a person of a high paying jobs. We have all heard stories of people with Ph.D.'s who drive taxis or work on construction crews. However, more educated people appear to be better off than those with less education.

Pilzer (1990) says that the unemployment rate is really 20% today. The discrepancy is that many people are counted as employed who are working 30 hours a week or less, but would rather work more. In addition, many people are taken off the unemployed list because they have given up looking for a job. That is occurring regularly. The positive aspect about having an education is that a person is less likely to stay unemployed; he or she can get retrained quicker.

Major Issues in Education

The following are what I perceive to be some of the major issues that come out of this discussion of a changing environment. First, what are the goals of education. I believe that the major goal of education is to help young people develop their potential to the extent it will allow them to be successful in a rapidly changing information/service global economy and to contribute to making that society a more pleasant place to live. A second issue involves the timing of education--how much time and effort should students put into being educated. The school year in the US is 180 days; however, that must be compared with considerable more time spent in school in Europe and Japan (210 to 240 days, on average). There is some discussion of year-round education in the US that is intended to address this issue. Another issue involves [school choice](#): who does schooling, how is it paid for? A related issue is [what kind of training should teachers have](#) and who should provide it? There is some discussion of moving from certification of teachers by state departments of education to national licensure. There is a great deal of difference between licensure and certification. When one is certified, that allows a person to take a job at a state-funded school. When one is licensed as an education professional, that person is able set up his or her own independent business and to provide services for fees. Educators would have to start operating in a similar fashion to medical professionals, accountants, licensed engineers, etc. The certification board run by the individual states might be eliminated in favor of a licensure board run by professional educators. When one begins to put these trends together--vouchers and school choice, licensure, technology available to access a wide variety of information--one can see that tremendous opportunities for educational restructuring are at hand.

An additional issue that is important is equity. How many people believe that everybody will have equal access to the technology we that we have been talking about? Does anybody believe that? Is it more likely that folks we might consider as upper middle class or higher on the socioeconomic scale will have more access? Even though most of our school children are gaining access through schools and public libraries, people with more resources have more access. In fact, telephone companies have plans to bypass many of the poor urban neighborhoods as they lay the cable required for access to the "information superhighway." One advantage of living in the US, though, is that even the poorest people in this country will likely have access to the technology before many of the wealthier people in other countries. That is because the price of technology is dropping by half within 5 years of its introduction. And by the time the old technology is half price we will see new technology that is twice as powerful. But the reality is that one has to have financial resources to stay on the cutting edge. And if we expect our entire nation, not just certain sectors, to operate at world class standards, it is imperative that we provide at least public school and public library access to everyone in our country.

In addition to equal access or equal opportunity, the equity issue also involves equal opportunity to gain the required skills. These are two very different issues. Equal access alone can lead to those who are richer, from the perspective of readiness to learn or prior knowledge, continuing to progress at faster rates while those who are less prepared continue to lag behind. If we want everyone to operate at the same standards we must provide extra time and instruction to those who are less well prepared. We do just the opposite in our educational system today. Everyone has free access to 180 days of schooling even though we know that not everyone learns at the same rate. Is it any wonder that children coming from more intellectually-rich environments do better in school under these conditions? We need to hold students accountable for a certain set of skills and then provide whatever time is necessary for them to attain those skills. Ben Bloom, through a process known as [Mastery Learning](#), has demonstrated that most students can achieve a level of excellence under these conditions (Block, 1971).

Conclusion

In conclusion, the environment within which we live is an important condition of learning that educators must consider when designing and implementing teaching/learning processes. I have touched on just a few of the many aspects of this changing environment. Undoubtedly, there are many others (e.g., see Kaeck, 1997 for his view on "[Today's America](#).") The most important issue I wish to address, though, is that, as educators, we are responsible for knowing about this changing climate and modifying our educational system appropriately.

Note: see *The Second Enlightenment Conference* for an update on [megatrends](#) and how our present age is a transition to a [molecular society](#).

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