GEARING UP WITH TECHNOLOGY: A CENTENNIAL CHALLENGE TO EDUCATORS, July 14, 1993

Address to the State Board of Regents, the State Board of Education and the Utah State Legislature, Cedar City

Governor Michael O. Leavitt

One wintery day I prepared to fly home from Washington D.C. A winter storm had caused a normally 45 minute drive to the airport to be over 2 hours. Upon arriving, I rushed to the ticket counter only to find that my flight and every other one scheduled to leave the airport that afternoon had been canceled. Still standing at the ticket counter, I set my baggage down to sort through my dilemma when to my shock I observed that the terminal was on fire. Flames emanating from an area 100 feet or so from where I stood shot all the way to the ceiling. I was stunned. Then I made a rather brilliant observation to the ticket agent. "Look at that," I said, "the building's on fire." The ticket agent glanced up from the ticket he was preparing and said matter-of-factly, "so it is."

As I prepared my remarks for today, I concluded that spending a lot of time describing the fact that we have flames of our own shooting into the air in the form of burgeoning enrollments, large class sizes and tight funding might evoke a similar response from you "so it is". Those conditions have existed for years. Having to produce more and higher quality services with fewer resources than ideal, has become a fact of life in both the private and public sectors. So today, rather than focusing on our problems, I want to talk about solutions . . . and what I believe will be the most exciting and challenging era in modern education history. Exciting because solutions exist. Challenging, in that it will require change. Change in the way we think. Change in the way we work. Change in the way we measure our success.

My desire today is to discuss the innovative use of technological advancements harnessing and merging for the education of our young people the enormous capabilities of computers, telephones, television and satellites. And the world-changing result of merging their functions together. The ability to transmit and communicate interactively and instantaneously all sorts of information data, graphics, voice and video to almost any location.

Growing up, I delivered newspapers around Cedar City riding a big, heavy, red, one-speed Schwinn bike. It had a big frame, wide handlebars and a well-padded seat. It could haul a lot of newspapers, but the hills were murder. I had a route that included Leigh Hill. There are many homes there now, but then only a few. At almost the top was former Representative Haze Hunter's home. Each day I would pause at the bottom of the hill and then pump standing up as hard as I could to get my big red Schwinn to the top of that very steep hill. Each day I would slow to a stop and have to push my load of papers the rest of the way on foot.

At 5 o'clock every afternoon, all the paperboys in town would meet at what we called the "paper shack" to wait for the Wycoff truck to bring the papers from Salt Lake City. I remember the day clearly when I demonstrated for the other carriers my new three-speed bike we called them three-speed "racers " then. . It had three gears that were changed with a thumb-shifter on the handlebar. Do you remember these? It allowed me to select a high, low or middle gear. By shifting into the lowest gear, if I peddled hard and fast, I could make it all the way to the top of Leigh Hill without stopping once.

Today, all-terrain 21-speed bikes are available. They are an engineering breakthrough . . . lightweight, yet strong, with amazing capabilities. One can shift to extremely low gears and climb steep, rocky hills with relative ease. On straight-aways you can shift up to a high gear and burn up a lot of road with one turn of the pedals. The basics are the same. You must still balance, pedal and steer, but tremendous additional capacity has been produced through improved technology. The 21-speed bike offers a variety of options, depending on needs, desires, training, and capabilities. It has many gears, big ones and little ones, and they work together to make maximum progress. It is highly efficient.

Education as we knew it 10 to 15 years ago was much like the old one speed Schwinn. It was serviceable and dependable, but it had just one speed. While some students pedaled faster than others, the system itself had not made a breakthrough into more gears and options.

However, progress is occurring. I commend our higher education institutions and our public education technology specialists who have worked hard to provide more gears, more speeds in our system. They have made notable and pioneering progress in the use of technology. Our Ednet system allows us to begin this effort with a remarkably strong base. We are expanding it rapidly. This year from 40 sites to 57 sites. The system has been limited because there has been only one channel and there is high demand to use it. So we're quadrupling the capacity from one to four channels. We are also making good progress in our use of Channel 9, the educational channel, and Comnet, a satellite network operated out of Utah State University. We are considered a national leader in distance education. Many of our education leaders in both public and higher education have caught the vision of where technology can take us.

Today, our system offers a limited amount of flexibility and choice, but not enough. You might say we are at the level of the three-speed "racer" bicycle. The system is on the cutting edge of today's technology and is serving thousands. Our challenge is to move to the 21-speed, all-terrain model by keeping pace with new technologies, and rather than thousands, we must serve hundreds of thousands.

To use the system today, a person must go to an Ednet site at a school or public building. As I mentioned, we are expanding from 40 to 57 sites. But, imagine the capacity of a system that is not limited to Ednet sites. A system that literally reaches every home, business and public building in the state for that matter, in the nation. From 57 Ednet sites to 500,000. And yes, we're expanding the number of channels. But imagine the unlimited capacity of a system with 500 channels.

This is not just a dream. It will soon be reality. As we speak, fiber optic systems are being planned and constructed by telephone and cable television companies. Within this decade, Ednet-type interaction will be possible over virtually unlimited channels from homes and buildings all over America. The potential impact on education is dramatic . . . no longer is the process restricted by place or space. Major universities in this country will be offering degrees to out-of-state students who never or at least rarely visit their campuses. It will become common for a student enrolled at Utah State to take a class from a professor from the University of Utah, or Southern Utah, . . . or Harvard or Stanford or Moscow or Bejing. Even a little more futurist are the educational possibilities of holography, and virtual reality. Imagine a renowned professor delivering a lecture in your living room by holographic image. At some point in the future we won't have an education summit in Cedar City in July, we'll just stay home and project our images here. Then in the evening we'll enjoy entertainment by projecting the Shakespearean production into our living rooms. And for the fun of it, we'll change the face of Othello to Jerry Sherratt and Rob Bishop to Hamlet. His lines will be . . . "To open the

caucus, or close the caucus . . . that is the question."

Other technologies support and hasten this trend. Internet is an international computer network that our teachers, parents and students could use today right now if we provide relatively inexpensive modem hookups across the state. Much interaction between schools and homes could occur on the Internet and lessons and curriculum could be downloaded by anyone with a computer and modem. And by the end of our Centennial year it will be possible to transmit not just words and data over the Internet, but video and graphics. What does this mean? It means a student could use an ordinary computer with a telephone and extract at any time or any place a lecture, complete with graphics and video and interactive exercises. These are among the most sophisticated curriculum tools known, and are not being used in many of our classrooms.

Add to that CD Rom technology. Currently, CD Rom can be utilized in a properly equipped computer to provide video, text, sound and graphics, all integrated. This year, major electronics companies will begin marketing CD Rom players that are the size of a notebook. The cost will be under $1,000 and the price will drop rapidly.

This means that soon, very soon, the lectures and exercises we are providing students in our classrooms, can be enhanced with video, sound, color and text, and delivered any time, any place, and as many times as necessary for the student to understand it. Will all of this replace the professor or instructor on our traditional campus model? No, but it will certainly change their role and activities. It will mean they spend more time in laboratory settings, or informal gatherings of students, freed from the lecture hall.

Truly, this multi-geared education system will provide many choices and options. It will take what used to be classroom activities to the home, to the college dorm, to many public gathering places. It will move faster overall, but students will have enhanced ability to set their own pace. Students will still have to cover the distance, still have to balance, pedal and steer. They will still have to work hard.

But having the technology is not enough. We must be trained to use it properly. The first time I rode a 21-speed bicycle, I tended not to take advantage of all the gears. The enhanced capacity did me no good until I learned to use it. The same thing happens with new technology. Without training, teachers, students and parents will tend to stay in one or two gears, not using the tremendous capacities available.

1996 is our Centennial year, 100 years as a state. We have chosen to commemorate our Centennial by empowering public schools with the opportunity to restructure and reinvent themselves. We have accepted nearly 100 schools as Centennial schools so far and we hope to add many more in future years. Parents, teachers and principals are making remarkable progress in competency based education and school-based governance.

It is now time to take another big step forward in both public education and higher education. Today I want to initiate that step by issuing three challenges that will take us to the next level in our pursuit of world-class education. When we hold this meeting three years hence, I hope we can celebrate our Centennial having made dramatic progress in technology delivered education.

THE CHALLENGES

FIRST, I CHALLENGE YOU TO MAKE EDUCATION AN ACTIVITY THAT IS NOT BOUND BY BUILDINGS, PLACE OR SPACE.

Let me elaborate. First, schools and campuses must facilitate, direct and enhance the learning process, but need not always be the location where learning takes place. We must get used to the idea of students learning at home, in dorms, at libraries, other community centers, and at work, not just in college or school classrooms. The learning experience must be extended to any location where a student can access teachers, lessons, tests, and other educational activities.

To do this, we must make a major shift, a historic shift, in our basic strategy. We must invest less in bricks and mortar, and more in technology. At the next legislative session I will announce a technology initiative. It will include components of training, and courseware development, as well as hardware and communications. It will bridge both higher and public education.

It will be a brave initiative because this transition will cost money. But much of the money will come from resources traditionally devoted in the budget to new bricks and mortar. We don't have the capacity to build the infrastructure of the future and still expand the infrastructure of the past at the same pace.

I propose that by the end of our Centennial year we make Utah an exemplary user of the Internet system. Our state will undertake the task of making Internet accessible to anyone with a computer and a modem. This is a major step in advancing the development of electronic highways throughout our state, providing remarkably enhanced communications among parents and teachers, and also providing access to thousands of data bases around the world. It will give every telephone the potential to provide access to the libraries and massive data bases of the world.

Next, Challenge #2: TO GO BEYOND DISTANCE LEARNING TO A NEW VISION A NEW LEVEL, MAKING TECHNOLOGY-DELIVERED EDUCATION A PART OF EVERY STUDENT'S EDUCATIONAL EXPERIENCE.

With distance learning we serve thousands. But this is a new vision. A system that serves not thousands, but hundreds of thousands. Not just the students whose unique circumstances create special needs, but a system that serves every student.

I challenge higher education to make available all courses necessary for general associate degrees through technology by the end of 1996. I also challenge you to expand the number of high-demand bachelor's degrees delivered through technology.

I'm not just talking about an expansion of television courses, but an expansion into every available medium. Entire courses should be obtainable on compact disk. For that matter entire majors could ultimately be placed on disk. The lectures could be filmed live, spiced with video clips, and enhanced with popup graphics. Students could be prompted and quizzed by interactive exercises throughout. None of this is new technology. What is new is it's universal affordability.

Such courses could be offered with regularly scheduled labs or discussion, or tests. Groups may meet once a week rather than 3 or 5 times a week. This multiplies the productivity of the instructor.

Should this type of education replace completely our current classroom method? Certainly not. But every student at every level should have a part of their education technologically delivered. Some institutions around the country require students to take one in five credits through technology delivered courses. In Maine, the number of student visits to campuses has been reduced 60 percent in 10 years. Why? Is it just because it's efficient? No. It's a critical part of the educational experience. Technology delivered education should join the three R's and the college general education core as educational requirements.

We owe this to our students. Technology is changing the way we work, live and learn. Every Utah student should become familiar, not just with Ednet, but Comnet, self-paced computer courses, Internet and other technology already available, as well as the expanded options that will become available over the next few years. Not preparing students for the technology-delivered world is like not teaching them to read.

But let's not pass over the efficiency benefit. We face expanding pressures. There are economic transitions occurring every day in this global high-tech marketplace. Thousands of people are returning to higher education, seeking the retraining they need to stay in the workforce. This trend will accelerate. Some say we should just limit access. That's not the answer. We must provide some form of postsecondary training to every prepared student, and we will never be able to meet that obligation if we continue a bricks and mortar mentality. If one in five credit hours is delivered this way, not only will we have provided students with an essential educational experience, but we will make major strides in meeting this obligation.

I challenge the public education system to have the secondary core curriculum available for delivery through technology by the end of 1996. I envision the establishment of a Centennial High School, a school with no walls, no bricks or mortar. Centennial High will have no football team, no cheerleaders, no cafeteria. It will be an electronic high school. Students can enroll in it concurrently as they attend a regular high school. They can move in and out, according to their needs. High School credit will be available and a wide variety of classes will be offered. Students from Moab to Midvale, Magna to Manila, will be able to attend Centennial High. Just like in higher education, classes will consist entirely of video, graphics and data, available on compact disk or downloaded over networks, whichever best suits the student's needs. Many classes could include supplemental live discussions over EDNET or personal interaction with local faculty. Others will be completely self contained.

An electronic Centennial High School can solve many of our remedial education problems in postsecondary education. If students don't have the preparation they need for college they can take technology-delivered high school classes to prepare themselves, complete with small group workshops to address individual needs. This moves us toward the seamless education system we need for the 21st century.

THIRD CHALLENGE: I CHALLENGE YOU TO PICK UP THE PACE IN EDUCATION.

Our system is defined too much by an institutional pace rather than the abilities or circumstances of individual students. For example, many young people waste their senior years in high school. We need to create incentives, financial and other, for high schools to move students though the system as quickly as the student has the capability to move. When a student has mastered high school curriculum, they should go on to college level courses or vocational training.

I propose the creation of a program to accelerate the education of those students who have mastered high school requirements before they would traditionally graduate. We will call it the Centennial Scholarship and Apprenticeship Program. Students qualify for the program by completing high school requirements early. Upon qualification, the state will award a $1,000 scholarship to any state-operated institution of higher education or applied technology center for which the student qualifies. The student may continue to participate in all high school extracurricular activities, including sports teams, band and orchestra, and social events. If the student desires apprenticeship training the $1,000 can be allocated as a grant to a potential employer upon successful completion of the apprenticeship.

We must also provide adequate incentives for the school. They will be permitted to keep the balance of the WPU, a little over $500, despite the fact that services are no longer being provided to the student.

Centennial High School, with its widespread availability of technology delivered education, will help make the scholarship program successful because motivated students will have increased access to classes that will accelerate their education.

Utah has a nationally-acclaimed advanced placement program and we are also doing well in concurrent enrollment. But we can double and triple concurrent enrollment through technology delivered education, providing motivated high school students with countless college options while they are still completing high school.

Colleges and universities, you must eliminate the roadblocks to timely graduation. We need to provide students a means to get their degrees in four years. Many students could earn bachelor's degrees in three years instead of five plus. The major roadblocks to this now are bricks and mortar, place and space, all of which can be eliminated as barriers by offering technology delivered education. We can make our system more productive, efficient and seamless with technology. Having classes available electronically at times that meet student needs can help prevent much of the delay and gridlock that now occurs.

There are other barriers. While much progress is being made in easing transfers among Utah colleges and universities, improvements are still necessary. The bottom line is there are a hundred reasons why it takes so long for a student to work through the system. I call upon you to remedy those that are caused by the system. A student needs to be able to get a four-year degree in four years.

CONCLUSION

In conclusion, I recognize that these are difficult challenges. I also recognize that there will be cynics and nay-sayers. Some will dismiss this emphasis on technology as a passing fad. I assure you that it is not. It is the future. Whether we accept these challenges or not, all of these things will happen one day. The only real question is whether we lead or follow. If we follow, other states, private schools, and even other countries will have an advantage over us. Some traditionalists may see this as simply a way for the governor to avoid focusing on things they view as more pressing, such as higher salaries and more classrooms. I see this as the best way to address those needs. Critics will point out that most teachers, students and parents are undertrained and ill-prepared for technology delivered education. They are right, but that can and will be changed. Some will argue that lower income and disadvantaged families will be left out. In reality, it is the disadvantaged students that can benefit most from this initiative. Some will say that this abandons the great traditions of the Socratic method. I contend that in many cases we traded in the Socratic method years ago for large impersonal lecture halls. Technology-delivered education brings Socrates back over Ednet, Comnet, Internet. The spirit of Socrates will be everywhere, teaching our citizens the critical thinking skills that prepare them for tomorrow.

This is the opportunity of a generation. It is the big gear, the 21-speed, all-terrain version. Technology will never replace great teachers. But it will be a powerful tool in teachers' hands, helping them facilitate and coach, not just lecture.

Utah is enormously well positioned to take advantage of the technological revolution that is occurring. We have a critical mass of world-leading high-tech companies that are willing to help us. Even today, we will make an exciting announcement about WordPerfect coming forward with a great new program to provide computer software training to our teachers and students statewide. We have a well-educated citizenry attuned to the potential of the telecommunications revolution. We have a great advantage in the expertise that already exists in public education, higher education, state government and the private sector. Our major institutions like the University of Utah and Utah State University are providing significant leadership in electronic education. We can make it happen here faster and better than anywhere in the country. We can take our education system from the old factory, assembly line, one-size-fits-all model, to a decentralized, competency-based system with freedom, flexibility and high efficiency.

We have in this room the people and the power to make these things happen. We are here today as a team. I am only one part of the team. A

governor in Utah does not directly control or govern education. I have at my disposal three tools. I have the power to recommend education budgets to the Legislature. I have the power to make appointments to education governing boards. And I have the power of the pulpit, which I am using today. I will not hesitate to use the others as well.

Together, we will move forward, as a team, in bringing Utah a fast paced, seamless education system. Thank you