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Committee on Technological Literacy**

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As an educator with more than 30 years experience throughout the public education system at all levels and as a heavy technology user, I have agonized for several years on why teachers are so reluctant to embrace technology. Even those educators identified as “early adopters” may use technology as a tool but a large number of them have not really entered a comfort zone with the technology itself. Except the small cadre of technology educators, few are trained to consider technology as a content area in its own right. The focus of this paper, for the most part, is on the experience and attitudes of teachers who have matriculated from “traditional” schools of education.

Many educators in the early eighties embraced technology as the solution to future problems. No educator at that time could accurately predict the future, but many believed this new educational tool could brighten it. When desktop computers began to appear in the schools, corporate leaders urged high school teachers to get their students “computer literate.” Computer savvy teachers who had learned Basic, a computer programming language, plunged into the task of teaching it to students. Then Basic disappeared and new experts prodded teachers to teach computer applications like word processing, spreadsheets, and databases. The focus shifted again by the mid-nineties and “integration” was the buzzword. Teachers followed each of these trends only to experience a workload increase and little reward for their efforts. They continued to experience intractable working conditions, an inherent unreliability of the technology and policymakers’ complete disrespect for their opinions. (Education Week, August 4, 1999)

There are several reasons, from a historical perspective, that change has come in some places slowly and in others not at all. Those promoting technology in the early eighties did a very poor job of selling it to teachers. There was no vision of what this

new paradigm could do for education, so it was decided that everyone at the secondary level should learn programming and know how a computer was built and operated. What happened was the turn off of the century. An entire generation of educators was lost to this new idea. The information shared was so confusing that educators immediately decided that technology was either not worth their time or too difficult for them. It was a repeat of the problems generated after Sputnik where science and math were presented in the same way. “Technophobia” emerged as a whole new problem for educators. This immediately sent teachers a message that there was no place for computers in their learning environment. Is it any wonder that American teachers who face more challenges than other world educators would be disillusioned?

Further validation for teachers that technology was of no value came from higher education and not just colleges of education. Education majors in many colleges receive their core curriculum courses from faculty in the college of arts and sciences. Until recently there was a total lack of any technology preparation occurring in colleges of arts and sciences and colleges of education. Even among those called “instructional technology” personnel, theory and instructional design dominated the curriculum. Higher education, in preparing future educators for the classroom, gave no thought to their needs and no attention was given to technology during pre-service course work. If anything occurred it was conflicting advice from experts, and this continues today. Many experts supported the negative views of Oppenheimer-Stoltz (Atlantic Monthly and Silicon Snake Oil) while others, as early adopters, like Negroponte, were totally enamored with the technology. (Being Digital) Very little was accomplished either way to help teachers move away from traditional teaching and into teaching using technology.

The National Council for the Accreditation of Teacher Education (NCATE) and The International Society for Technology Education (ISTE) provided another barrier to teachers using technology rather than a bridge. Accreditation for higher education institutions is based on NCATE standards and all of those standards include the ISTE standards. While meaningful, these standards limit educators by presenting technology as a tool and not as a learning issue in and of itself. These standards, together with other issues, have driven certification throughout the country. Although some states embrace technology as a certification area, many do not. Teachers are not encouraged to seek

pure technology degrees, as there is little financial incentive in education for non-certificated areas.

Financial reward is not the only problem. While there is tremendous demand for teachers with technology education degrees, especially in the states where such certification exists and where there are middle and high schools with technology education in the curriculum, teachers clearly are not swarming to technology education programs. Many schools' technology education programs are closing down due to a lack of qualified teachers. The International Technology Education Association (ITEA) acknowledges a national technology education teacher shortage. Why is this happening?

The educators who have the technology skills are generally lured away from education. There is a severe shortage nationally in all sectors for those who can work with the technology and business and industry have become one of education's greatest competitors. In my own college of education, I have watched young professionals leave the university for jobs in business and industry before they even finish degrees. These students are those who are most talented with technology. Salaries well above what education would ever offer are common. The average teacher in Georgia has a beginning salary of \$25,000 while technology savvy students leaving the university, even without a degree, are offered \$40,000 and up with a much nicer working environment. Educators with these talents are not nurtured emotionally or financially in education.

The message to educators has not changed since the eighties -- technology is difficult and can only be handled by the most talented among us. Breaking this cycle will not be easy. This is a time when the need for new educators is overwhelming. The forecasters estimate that the United States will need 2.2 million new educators in the next 10 years. Quality is diminished when supply and demand changes this rapidly. Progress that has been made in the last three to four years will be diluted as institutions of higher education and state departments of education rush to place "bodies" into the many needy classrooms in this country.

There is no easy solution nor is there one solution. One critical issue is collaboration. Education has to become a joint initiative among government, businesses, communities and educational institutions. More attention to a comprehensive P-16 approach will help make education a lifetime experience that requires flexibility and

change that is necessary for scale of economies and innovations. The image of education ending with a degree will not serve this country for the twenty-first century.