

Abolishing the Digital Divide:
Using the community to enrich federal programs

Introduction

We are currently living in a globalized world where our reliance on technology is constantly increasing. We confront computers in our everyday lives for work, entertainment, and survival purposes. Those without exposure to computers before they leave their schools will have a difficult time reaching their full potential because of the handicaps they suffer in their discomfort with computers. There is absolutely no substitution for the benefits of computer use in our classrooms because of the effect it has on the student and learning environment. We can no longer provide everyone with an adequate education without computers, yet students from low socio-economic backgrounds find themselves without access to this crucial component of their education every day. The discrepancy in technological access between low and high poverty schools is absolutely unacceptable. In order to increase access and limit the digital divide, we must not only focus on federal aid, but also bring our efforts back to the community. It is the responsibility of our communities and educators to make sure that access to technology in this country does not exaggerate the deep divisions already present within our society. It has the potential to help equalize our schools and we must take advantage of every opportunity we are given.

Benefits of Educational Technology

Implications for learning

Computers can play an incredibly important role within the classroom. The internet expands teaching and learning resources and allows teachers and students to communicate with

others. Meghabghab notes that it provides world wide access to information that has broken “isolation barriers”, especially in rural areas (138). In having the ability to communicate with this new range of children, students are exposed to different cultures and lifestyles than their own, broadening their scope of the world. It also allows instructors to provide different means of learning. These different modes of instruction play to different learning styles that will help students process information and better comprehend the content (Debevec, 293). For example, the multimedia instruction may allow someone who is having difficulty comprehending verbal instruction understand it within a visual context. Teachers now have the opportunity to reach students in a more individualized manner. In Coley et al’s study of technology’s impact on our schools, they found that not only do students learn more in classes with computer based instruction, but there were also positive effects in all subject matters from preschool through high school (9). Reed found that “a successful technology program can bring about significantly improved test scores” (6). Computers provide a variety of ways that increase a students learning potential, in addition to the access to computers, which will allow students to have more success upon graduation.

Expanding on No Child Left Behind

With our current state of education so focused on test scores as a result of No Child Left Behind, it is absolutely crucial to find a way in which to individualize the education process. Without an individualized education, students will become bored with the content fairly quickly because they have no interest in the subject matter since it is not geared specifically towards them. There is no way to avoid test taking because that allows schools to receive the money in which to fund computers, but students can still receive a true education while preparing for tests. In studying the impact of technology on students, Du found that when used properly, computers

allow students to learn at their own pace. It accommodates for their unique needs, abilities, and learning styles by allowing the students to access incredible amounts of information as well as to discover and create on their own. In leaning more, they are further preparing themselves for the tests, more so than each individual teacher would have been able to do on their own. As discussed earlier, computers have the ability to increase test scores in all subjects, directly increasing success in No Child Left Behind. When students are given the opportunity to individualize their education, they are still learning the core concepts and ideas, but in a way that they enjoy, allowing them to increase their potential and achievement. The increased content they learn as a result “helps to reduce the learning gaps related to a student’s social background” (275). This individualized content is more similar to what the low poverty schools are receiving than what the high poverty schools would receive without computers. This allows them to have more of an equal opportunity for success when entering the tests.

Graduation

The longer we keep students in school, the more of an opportunity we have to expose them to computers, and the greater potential they will have when entering the workforce.

Studies have indicated that students are more likely to stay in school when they have access to computers. Coley et al found that schools experienced higher attendance rates and lower drop out rates than they had in the past after introducing computers into the curriculum (11).

Computers and similar technology enhance student enthusiasm and motivation to the point where it directly affects their performance. They are “motivated and empowered” (Coley et al, 10) because of the new information and possibilities accessible to them. This makes them more excited about their learning process, which will in turn create an intellectual curiosity that will follow them throughout their lives. Computers have the potential to make children “happier,

more productive members of society” (Hamilton, 2) which will make the current financial concerns almost negligible.

Enhanced workforce and citizenry

In this “information age”, those who are unable to access and process data will find themselves unemployable upon graduation. When students do not have computer skills they are simply not prepared for success in the outside world. Studies have shown that more than half of seventeen year olds in this country are inadequately prepared for technical jobs (Bowman, 7). Without the proper preparation, our students will only have the ability to work in jobs that do not require the use of computers and other such technology they do not have access to. Students from high poverty schools that do not have access to computers already have so many disadvantages to their lives in comparison to students from low poverty schools that the technological set-backs only continue to decrease their potential. When these students do not have the opportunity to reach the same careers as their low poverty counterparts, they will never have the ability to move out of their poverty based lives. This, in turn will force their family to continue within this poverty cycle.

Technology gives us the opportunity to begin the equalization process of education. With equal access to technology comes more of an equal chance at success. While there will always be those with the advantages, technology gives us the opportunity to limit those disadvantages. As a result, the stronger applicants will be rewarded with the best jobs as opposed to the most advantaged applicants. This has a series of implications for our citizenry; it has the potential to even change our priorities in that personal strength will finally have the opportunity to be rewarded.

The Digital Divide

Technological segregation has always been a problem from warfare to medicine, and socio-economic factors today are playing a disturbing role in terms of access to computers. We can clearly see this inequity within our own educational systems. The range of per pupil expenditures in public schools ranged from \$2,000 to \$17,000 in 1994 (technology, 2) which makes equitable access to technology virtually impossible. While the average ratio of computers to students has decreased dramatically, from 125 students per computer in 1984 to 10 students per computer in 1996 (Coley et al, 13), there is still a frightening discrepancy between access to technology in low poverty schools compared to high poverty schools. Schools with the most economically disadvantaged students and with the most minority students have the highest computer to student ratios (Coley et al, 13). While we must promote equitable access to students between districts, there is also a necessity for all students within each district to have access as well.

Even with the present inequities between school districts, schools further the discrepancies by clumping all their computers within a couple grades. Statistics indicate that elementary schools have the least access because districts focus on enriching the high schools (technology, 3). By the time they reach high school, the inequities the students have suffered are so great that it may even be too late to introduce them to computers (technology, 3). Rather, schools should introduce computers to students when they are young, in elementary school, so that they develop an understanding and enthusiasm for computers that they can carry with them throughout the academic careers. As a result, the students will use computers to their complete advantage and therefore reap the most benefits out of them.

The way in which the schools use the computers also has a significant impact on the experiences the students have with technology. Low poverty schools have the programs, resources, and teacher trainings to have the ability to use computers for problem solving and critical thinking problems. These exercises allow students to take advantage of everything the computer has to offer. On the other hand, high poverty schools have limited computers with teachers who have a limited understanding of computers. As a result they are only able to use whatever computers they have available to them for drill practices. These programs simply reinforce what they already know and are not stimulating in any sense of the word. They could even have a negative effect on the students in that they may forever be turned off of computers.

The districts and schools that students attend reflect the economic situation of the students. As a result, students attending schools without the funds to purchase computers will most likely not have the funds for their families to own a computer at home. Computer use at home has been proven to be more effective than computer use at school (Du, 281), but clearly it is more realistic to focus on exposing students to computers at school rather than each individual home. On the other hand, students who are economically advantaged not only have access to computers at school, but at home as well. Even if they are not receiving proper instruction on the computers in their homes, the children are still being exposed and familiarized with computers.

This segregation does not allow for equal opportunity within our citizenry. Those without the resources do not receive the same education as those in low poverty schools, and therefore don't have the same skills upon graduation. They don't stand a chance in the workforce without those skills and are forced to settle for lower paying jobs. As a result, economically disadvantaged students are never able to release themselves from the poverty cycle. Their education is merely reinforcing it.

On the other hand, low poverty students have all the technological opportunities in the world because they have been exposed to it both at home and at school since an early age. By the time they enter the working world they will be completely comfortable with computers while their economically disadvantaged counterparts will be just learning how to turn it on. Living in our technologically rich society, it is not difficult to imagine who the more successful and productive member of society will be.

Apprehension Towards Computers

While there are an infinite number of advantages that computers create for students, many skeptics still have a hard time investing in them because of all the extra time, effort, and resources they will use. First and foremost many believe that the resources that would be used on computers could be utilized in other ways. The schools in question are already struggling and they feel as if it would be more worthwhile to focus those funds on more traditional and therefore reliable resources. The majority of skepticism in terms of computers stems from the training and time that would have to be utilized in order to benefit the most from computers. Computers will only produce positive results for the students if the educator has a complete grasp on the role and use of the computers and programs. Because the educators are just beginning to be exposed to computers as well, the school must provide training sessions for the teachers which not only takes time, but is another drain on the fund of the school. In addition, because of how new computers are, companies are constantly coming out with new, more complex software. As a result, teachers must continuously be trained on the new software.

With No Child Left Behind and other current educational policies, schools, especially the high poverty ones, have been forced to focus their attention solely on the standardized tests. The computers, on the other hand, are not on these standardized exams and are therefore not

considered worthy of precious class time. It is seen as a waste to teach students anything that will not be on a test, regardless of the implications this has on a child's future. The argument is that it is more important for a child to have a school to go to than anything else. Without passing test scores, the children will have no school to attend, making computer access seem like a superficial, unnecessarily frivolous expense. But as discussed earlier, computers create a variety of advantages that have the potential to increase test scores.

Addressing the Digital Divide

Federal Solutions

In an attempt to equalize the previously discussed inequities, there have been a variety of federal funded programs. As part of the Educational Excellence for All Children Act of 1999, Title I targets low achieving, at risk students and provides those schools with computers. It was believed that the computers could provide “endless opportunities within a non-threatening context” that would be involved in the trend of making all citizens “computer literate” (Hamilton, 2). But, as with most federally established programs, the resources are not nearly where they need to be in order to make a significant impact and technology is nowhere near the standard of the low poverty schools (Coley et al, 14). Unfortunately there are only so many computers the program can supply, which is not nearly sufficient to meet the needs of the schools in this country.

Title II, Part D, of the Educational Excellence for All Children Act of 1999 titled “Technical Assistance: Building Capacity for Improving Schools”, is a “national, comprehensive, and integrated system of technical assistance” (Educational Excellence, 65) for underprivileged students. It redirects resources to districts with the greatest needs to purchase technical assistance. This assistance provides services that are appropriate specifically to their needs and it

builds their ability to identify and solve problems on their own. They also provide assistance to schools on how to use the educational technology to help students achieve to their greatest potential (Educational Excellence, 66). In addition, it creates a nation-wide system that supports “interactive information sharing and dissemination” (Educational Excellence, 65). While it has proven to be fairly successful, there still need to be more support teams in order to accommodate for all those who are in need of these services.

Within the same educational excellence act, Title III, “Technology for Education” was created. This also provides the economically disadvantaged schools with technological help. It “stimulates the development and use of innovative technologies” and encourages new approaches to distance learning and information exchange (Educational Excellence, 73). This support expands their access to challenging coursework and educational resources, which in turn “helps all students develop problem solving skills and achieve high academic standards, as well as achieve technological proficiency” (Educational Excellence, 73). The program strongly supports school exchanges with “technology proficient” districts. This allows the high poverty districts to have access to technology that they cannot afford for themselves. This program understands “in the near future, technology...will reshape the ways of knowing and learning” (Educational Excellence, 74), and attempts to allow equal access to these technologies. But, again, federal programs can only do so much and many districts are still in dire need of help.

As we can see, the federal government has been attempting to equalize this problem of access. The next step for federal programs is not to restructure their programs. This is simply a drain of time and money and our schools need the computers as soon as possible. Rather, the federal programs need to focus on how to reach *all* the schools, even if the little bit of help seems minute. Every bit of federal support will be helpful in creating a base from which the district can

build their technological opportunities. Without the federal support, schools will not have a place to even start from.

Technological Solutions

There have also been discussions concerning changing the actual computer itself. Many believe that standardizing the personal computer would make it less expensive, making it more affordable for schools. In addition, these standardized computers wouldn't constantly be upgraded, saving both time and money in trainings and new software (Meghabghab, 138).

Another idea is "a system wide online service for shared reference databases, universal material borrowing, and unlimited access" (Meghabghab, 137). This would not only provide more access to information, but it would connect all students and teachers together, providing them with more people to communicate with.

While both would be beneficial to schools, we cannot wait for the computer companies to provide the means to equalize education because it is not a priority for them. We must take it into our hands and increase access within each individual community.

Community Solutions

There are many things that can be done within each specific community in order to increase access to computers. By involving the community there will be a broader base of support and funding. In addition, it will make it easier to pass a referendum if necessary. The primary community-based yet indescribably helpful area of access is in public libraries. If the community public library bought enough computers to create a computer lab, students would have much more access and therefore exposure to computers. This will allow them to experiment and become comfortable on computers which will give them more of an opportunity to be employed in a technical job.

Parent training sessions should also be offered through either the school or public library in order to expose parents to this new technology. This will have the same effect on the students in that it will give them the opportunity to acquire higher paying jobs, which will in turn benefit the community. Although it will not have the same long-term effects that student exposure has, it will affect the situation of the family which can in turn provide more opportunities for the student. The community must take advantage of every opportunity it can create for itself, but those opportunities will only be available if the community works together towards this common goal.

Conclusion

Educators are constantly struggling with the issue of equity and it does not seem as if the fight will end soon, if ever. While technology alone will not solve the problems of inequity, it will begin the process and the more we can close the inequity gap, the closer we are to our goal. The goal of equity is not simply to provide everyone with an equal education, but it is to do so in order to allow everyone equal opportunities outside of the school. Without the same education, disadvantaged students will never have the opportunity to leave the cycle they were born into. They will have at best hold a mediocre job and their children will receive the same education which will place them into the same level job. If technology is only present in advantaged schools, those students are the ones who will continue to be successful. By no means will technology alone allow disadvantaged students to automatically have every opportunity, but it is a step in the right direction. Equity in technology can be one step towards an equal citizenry. We must take our efforts of technological equity back to the community where it will have the greatest effect on those who are fighting for a change. Without the support of the community, students will never have the access that is necessary for them to be successful.

Annotated Bibliography

Bowman, Barbara. Equity and Young Children as Learners. Chicago: Families, Technology, and Education Conference, 1998.

Bowman discusses how children from low-income and minority communities are not taught the proper skills and knowledge to participate in this country. She discusses how schools must begin early in recognizing how children learn and use software and technology that will give all children the same opportunity to participate in our technological world.

Coley, Richard; Cradler, John; Engel, Penelope K. Computers and Classrooms: The Statue of Technology in U.S. Schools. Princeton: Educational Testing Service, 1997

Coley et al report on the status of technology in the United States. They study school access to technology and student use of computers. They then evaluate the impact of educational technology and asses the content and quality of courseware as well as the costs of educational technology.

Debevec, Kathleen; Shih, Mei-Yau. "Learning Strategies and Performance In a Technology Integrated Classroom" Journal of Research on Technology in Education. 38.3 (2006) 293-307

Debevec and Shih explore student's use of technology for learning in comparison to more traditional methods in their study of technology in education. They discuss how instructors can provide different ways of learning that can help students process information better. Their results suggest that there are multiple paths for optimal performance.

Du, Janxia, et al. The Impact of Technology Use in Low-Income and Minority Students' Academic Achievements. Educational Longitudinal Study, 2002.

Du et al analyze data from the Education Longitudinal Study of 2002. The report examines computer use and how it produces general benefits for all children and differential benefits to low income and minority students. They examine computer use at home versus use at school and find that home computer use creates different opportunities socially, while school computer use creates generic benefits for all.

Educational Excellence for All Children Act of 1999: An Overview of the Clinton Administration's Proposal to Reauthorize the Elementary and Secondary Education Act.

Title II, Part D. Washington: US Department of Education, 1999

This overviews Title II, Part D of the Educational Excellence for All Children Act of 1999 from the Clinton Administration. It discusses the groups, laws, effects, and possible solutions within the act.

Educational Excellence for All Children Act of 1999: An Overview of the Clinton Administration's Proposal to Reauthorize the Elementary and Secondary Education Act.

*Title III. Washington: US Department of Education, 1999
This discusses Title III of the Educational Excellence for All Children Act of 1999 from the Clinton administration. It discusses the problem, past solutions, results, and possible solutions in order to equalize technological access.*

Forgasz, Helen J. Equity and Computers for Mathematics Learning: Access and Attitudes. Australia: Monash University, 2004.

Forgasz discusses a study on equity and computer use in mathematics for seventh to tenth grade students. Surveys ranged from points of access to attitudes towards computers and mathematics. Equity factors in terms of access were found to be more relevant than attitudes.

Hamilton, Venessa. Computers and Reading Achievement. Chicago, 1995

Hamilton's study examines the effect of computers on the reading achievement of third through sixth graders within a low socioeconomic status community. She also discusses Title I and the effect it has on these students. Finally, she discusses the different types of computer instruction and what the most productive means of instruction are.

Meghabghab, Dania B; Price, Catherine. The Impact of a Technology-Rich Environment. 1997.

This report studies the system the state of Georgia has towards funding its k-12 schools and how it has redefined education at all levels. The impact of the increased equity in technology is evident across many of Georgia's schools. The paper describes the impact on information access, teaching and learning. Finally, it provides a series of recommendations for technology implementation.

Technology: The Equity Issue. Research Brief # 14, 1994.

This brief discusses technological equity and the relationship between socioeconomic factors and computer access. It then suggests different policies schools should consider in order to increase access and exposure.

Bibliography

Clements, Douglas, H. Computers in Early and Primary Education. Prentice Hall Inc, : Englewood Cliffs, NJ. 1985.

Reed, Lorrie C. Lessons Learned about Urban Education. Chicago: Chicago State University. 2000.

Tobin, Mark. Improving Student Retention through the Use of Technology. Masters Actions Research Project, 1999

Welter, Cole H. Technological Segregation: A Peek through the Looking Glass at the Rich and Poor in the Information Age. Research Library, 1997.