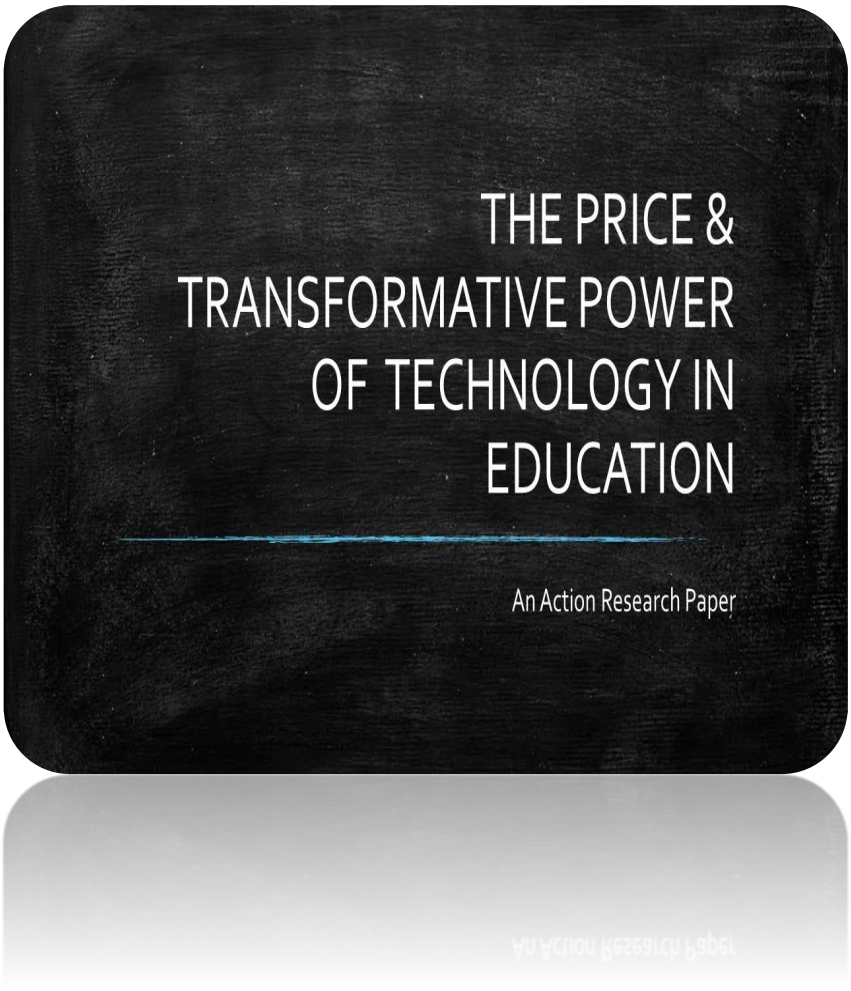

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Action Research Paper:

The Price & Transformative Power of Technology in Education

During the Late Middle Ages there was a long held tradition "that forbade a serf to send his son to school without his lord's consent and reimbursement for the loss of a farm hand." (Durant, 1957) It was thought that much of the working class did not need to be literate but the aristocratic landowners simply required a strong back and a healthy work ethic from their laboring serfs. Books, knowledge and information was given to the ruling class and the clergy. Books were hand written; costly to make and duplicate therefore only the church and the wealthy landowners had access to much of the written knowledge available. In this manner the powerful elites; the nobility and the clergy had the absolute power of information. Looking back throughout history, whenever the masses were allowed to improve their status through education, significant periods of enhanced productivity followed. In "The Growth of Knowledge" Will Durant examines the period following the expansion of universities where "Benedictine monks, Franciscan, Dominican, and other friars maintained their own colleges at Oxford, (and discovered that) from these monastic academies came some of the most brilliant men of the fourteenth century; …" (Durant, 1957) What followed was the information that led to the development of an urban commercial world as opposed to the previously established agricultural regime. Imparting knowledge from the sciences led to better health and increased human lifespan. If information had been made freely available to all people in an equitable manner at this time, one can only imagine what the true potential of humanity could have been.

Historically, we have had these frequent periods of great economic inequality that lead to greater disparities between the social classes. In Michael Harrington's classic work, The Other America, he examined the residual affect and detriment that these disparities exacerbate and

determined that economic inequality led to poorer education outcomes, inadequate nutrition which caused health problems, increased mental illness and a number of other high risk concerns that frequently persist over generations. (Harrington, 1962). For brief periods following social outrage and political action, the nation has come together to work to alleviate these disparities within the educational system and other areas so that we effectively and vigorously provide our students with access to knowledge through books, trained teachers, effective curriculums and the funds to finance the implementation of these programs. Most recently, in the last thirty to forty years or so we have failed to do this and our educational promise has been decimated piecemeal. Initially following the cuts to the educational programs that were established to bridge the gaps in education, the affects were small, but these have since grown exponentially to the point that the country as a whole has dropped to ranking "well below the worldwide average in just about every measure of skill. In math, reading, and technology-driven problem-solving, the United States performed worse than nearly every other country in the group of developed nations." This is according to The Organization for Economic Cooperation and Development which just put out a report documenting the results of the Survey of Adult Skills – which collated data on adults' proficiency in literacy, numeracy and technology-driven problem solving around the globe. (Ferdman, 2013) An interesting fact to take into consideration, is that an apparent deficiency was not the lack of computer literacy per se but an apparent deficiency in Americans "ability to understand, evaluate, use and engage with written texts to participate in society, to achieve one's goals, and to develop one's knowledge and potential" (p. 63). This factor points to the idea that while we know that these tools must be made available to our students many other issues come to play in their education. The tools we chose must be able to facilitate the learning process and improve performance. We must be able to evaluate the results of the assessments and the benefit

and utility must be apparent or the course must be changed. We need to measure the affects equally and determine if the apparent disparities have been effectively overcome or accounted for, prior to evaluations.

Educational researchers have described the discrepancy in educational resources where the student did not have access to a computer at home, and the home did not have access to high speed internet service or broadband, as the "digital divide." While computers and access to the internet is considered to be a profound tool in providing new information and communication technologies to the people, it is also considered "an unprecedented new tool for development." (Wikibooks, The Free Textbook Project, 2014) These elements are part and parcel in the providing and sharing of information today. The Information and Communication Technologies for Poverty Alleviation research article examined information prepared by the World Bank that reported, "The assertion that a knowledge gap is an important detriment of persistent poverty, combined with the notion that developed countries already possess the knowledge required to assure a universally adequate standard of living, suggest the need for policies that encourage greater communication and information flows both within and between countries." The European Commission additionally reported that "poverty should not be defined merely as a lack of income and financial resources. It should also include the deprivation of basic capabilities and lack of access to education, health, natural resources, employment, land and credit, political participation, services and infrastructure." Widening the definition of poverty to "being deprived of the information needed to participate in the wider society…" (European Commission, 2001)

The United States Department of Commerce commissioned the Economics and Statistics Administration and National Telecommunications and Information Administration to filter through Census data and determine the number of households that had access to a computer at

home, as well as how many households had computers along with internet access. They graphed this data by household income. It was discovered that 23% of households in the United States did not have a computer at home. About 46% of low income households did not have access to high speed internet service or broadband. These graphs representation of the household demographics of computer use and broadband adoption based on race, ethnicity, household income and education revealed blatantly obvious correlations between these factors; that those low-income, minority families without higher educations were those without access to computers and high speed internet or broadband. (Economics and Statistics Administration and National Telecommunications and Information Administration, 2011) Those that hope to bridge and close the digital divide within education cite the fact that many resources created and used today require students to have access to technology, computers and the internet. Students also need to learn how to operate this equipment for their own future education and eventual professions.

Within the Teachers College at Columbia and at the Campaign for Educational Equality, educators compiled a list of basic requirements for the welfare of students. Within this is a section that lists the instruments for learning. This includes, A Sufficient and Up-to-Date Library Media Center, Providing a Sufficient Number of Books and Up-to-Date Instructional Technology and Software. Sufficient and Up-to-Date Instructional Technology Including Computers, Related Hardware Such As Printers and Appropriate Software and Supplies. The incidentals make life easier, but add to personal costs. (The Campaign for Educational Equality, 2014) The average student does not have access to the school computers outside of regular school hours. Some can go to the library or a computer lab before school hours – typically for half an hour – and then they may miss breakfast at school. Some can stay after hours, but usually only if they are in a tutorial program. If the student wishes to access the abundance of digital

information, he or she would need high speed internet and some digital device, preferably a computer. The average library today has a mix of hardcover, softcover and digital books. Many more textbooks are moving towards digital. The publishers are promoting this by including additional features, and study aides within the digital copies. It is important to also note that the average price is five times more for the old fashioned hard copy. Magazine subscriptions are also more widely available in digital formats, and less costly to come by. While the price of a computer can vary widely; a run of the mill desktop with the most commonly used features runs an average of $500.00. Next, the student would need to shop for an ISP – or Internet Service Provider and decipher the cost of broadband for their home.

The U.S. Department of Commerce asked the households that did not have computers at home, and/or internet access, why they did not. The vast majority cited *cost* as the factor in their decision not to have these vital tools. If you examine the living wage calculation for Texas and compare this to poverty and minimum wages, the premise is quite understandable. I researched areas that have the highest concentrations of child poverty, as well as the highest illiteracy levels which maybe evidence of the insidious nature and a cycle of inequities within the public education system. For metropolitan areas with populations around 500, 000 the McAllen-Edinburg-Mission, Texas area ranks #1 in the percentage of households living in poverty. For the metropolitan area of Brownsville & Harlingen with a combined estimated population of 408,054 The U.S. News and World Report found an estimated 145,961 living below the poverty line: Culminating in a Poverty rate of 36.3 percent.

Two educators wrote on a blog about fighting illiteracy and poverty in the Rio Grande Valley and stated that in their research and experience: "The less fortunate children are found living in colonias along the Rio Grande River. Their socioeconomic status makes life difficult for

them; other more fortunate children enjoy the luxury of having books, iPads, and every other educational gadget available to them, they also have educated parents that encourage them to read, write and study at home, and this helps tremendously when you get to school."

Following this premise, I polled students in an average fourth grade classroom in my community consisting of students in age from nine to twelve years of age, and discovered the following information:

73% stated they had access to a computer at home, while 10 % of these stated that it was in the form of another digital device (such as a PlayStation, XBOX or tablet device)

76% stated that they had access to the internet at home. Of these –

42% stated that they had Broadband (many were unclear as to what service they had)

15% stated they had mobile Broadband (Verizon, AT & T, T-Mobile)

4% stated they had Dial-up, Dish or a satellite service

38% stated "Other", which included answers such as "I don't know."

54% of the students polled stated that they had been assigned homework or research that required them to use the internet at home, (or on their own time). Of these students,

23% stated they would go to the public library to do their work. (See Appendix 1)

This very same area in Texas; the Rio Grande Valley reveals a 40-100 % illiteracy level. Cameron County had a 43% illiteracy rate while Hidalgo County had a staggering 50% illiteracy level. This was measured by the National Center for Education Statistics in the U.S. Dept. of Education, Institute of Education Sciences on January 2009 which tested Basic Prose Literacy Skills (BPLS) "Prose literacy is defined by reading materials arranged in sentences and

paragraphs. Examples of prose literacy include newspaper articles, editorials and brochures. Adults who lack BPLS have skills that range from being unable to read and understand any written information to being able only to locate easily identifiable information. In short, commonplace prose text in English, but nothing more advanced. The percentage of those who lack BPLS reflects the magnitude of the adult household population at the lowest level of English literacy." (Texas LEARNS - Texas Center for Adult Literacy and Learning, 2014) So it was not surprising when this year Forbes declared Brownsville, Texas #4 in the least educated cities in America & McAllen, Texas #9. (Kathryn Dill, 2014)

Since the feudal era, we would hope that we have progressed as a people to strive to raise all our children to be the best that they can be. To endeavor to educate all our children with every available resource in an equitable manner. The fight for equity in educational resources and to close the digital learning gap needs to begin now. Only when we educate our children can we expect our community to climb out of poverty. The idea that only the privileged few should have access to the best we have to offer in educational resources seems to me to be an affront to all that makes us humane and decent. We run the risk of squandering the potential of the majority of students as well what could be the best and the brightest hope for our future if we do not offer all that we can to those that we hope and expect to educate. As Bill Clinton stated,

“It turns out that advancing equal opportunity and economic empowerment is both morally right and good economics, because discrimination, poverty and ignorance restrict growth, while investments in education, infrastructure and scientific and technological research increase it, creating more good jobs and new wealth for all of us.” (Clinton, 2012)

Appendix 1:

Survey Results: “Access to Technology”

1) Do you (or someone in your family) have a computer at home?	Yes No We have other digital devices; such as a PlayStation, XBox 360, Smartphone, etc..	35 8 5
2) Do you have access to the internet at home?	Yes No	38 11
3) What type of access to the internet do you have?	Broadband - Cable Modem (like Time Warner Cable), DSL (like AT&T) Mobile Broadband - (via T-Mobile, Verizon, AT&T Mobile, etc.) Dial - Up - (Dish, AT&T, Earthlink, etc.) Other (please specify)	20 7 2 18
4) If you have a computer, what type do you have?	Desktop computer Laptop computer	15 15

	Tablet device Other (please specify)	6 11
5) Do you have more than one computer or digital device in your home?	Yes No	36 12
6) Do you have access to a computer or other device whenever you need it? (Do you need to "share" with a parent or sibling?)	Yes No Other	30 13 5
7) Are you assigned homework or projects which require you to use the internet?	Yes No Other	28 7 5
8) What do you do when homework or projects require you to use the internet?	I do all my work at home. I use a computer at school. I use a computer at the public library. Other (please specify)	26 1 11 10
9) If you only have access to a handheld device - a	Always work for the type of school work you are assigned.	18

smartphone or cellular phone, does this	Sometimes works for your school work. Hardly ever works for school assignments.	20 6
10) If you do not have access to a computer (or other digital device) at home, do you believe having access at home would help you with your class work?	Yes No Maybe	22 4 21

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