EDUU554 Social Implications of Educational Technology

"How to Help Educators Effect Change and Equity"

Literature Review

Of Articles and Research From On Line Electronic Journals
and Organization Websites

Across the wide worldwide digital divides are human bridges. These bridges are not born but made. Many online articles about digital equity conclude that well trained educators affect positive impact on students and reduce some of the divides. The teachers become the bridges. This review will briefly summarize research and review articles which explain how human bridges are made. The following definitions are like those in both prestigious (such as government bureaus) and lesser known sources (professional organizations). *Digital equity* refers to physical access and availability of equipment, connections, appropriate training. *Equity* is also respectful, motivation by educators regardless of the student's race, age, gender, religion, culture, physical abilities, or socio economic status. *Digital divide* refers to absences, inequities, and lack of access, use, training, etc. based on differences. *Change* in this context is related to the integration of technology with subject content, curriculum goals, instructional methods and traditional classroom settings. Change brings new dynamics to student learning. The human – the educator, causes desired change of digital equity for students. To understand how human bridges are well trained and bring about change, we will consider reports that 1) document some of the results, 2) publish examples of the divides to be reduced, and 3) describe specific development methods.

The article "Affecting Change: The Power Behind the Human Element", (Bartley, 1999) puts forth a concise argument for humans who affect change in instructional technology. Bartley, a graduate student at University of Virginia, mixes personal experience with many conclusions from research. She writes out a path of defining change, human element, and school culture.

"Change must include professional development and support." (Harrington-Lueker, 1996, Office of Technical Assessment (OTA), 1995). The human infrastructure must be more important than the technology infrastructure. (Cooley 1997).

Citing each example, she summarizes numerous strategies:

- Development sabbaticals and mini-conferences (Yee, 1998)
- Ed-tech teams (Cooley, 1997)
- Generational model (Caverly, Peterson and Mandeville, 1997)
- Restructured staff development (Truett, 1997)
- Experts for curricular issues from within the culture served and Multiple facilitators (Zehr, 1997)
- Administrator level technology education (Harrington-Lueker, 1997)
- Job sharing (Polin, 1992)

Bartley also found that research points overwhelmingly to effectiveness of onsite support (Meltzer and Sherman, 1997). She states that school sites can become supportive and excited about integrating technology (Zehr 1997). "The human element, as a fundamental need (for change) has always been there. It is now time to name it, validate it, and provide for its continuation" (Bartley, 1999 ¶30).

The human bridges we desire also have a thorough resource in the form of a state wide model. The Regional Education Technology Assistance (RETA) project published a 75 page document detailing the activities and results. (Education Development Center [EDC], 2002). This evaluation reports the fourth year of teacher technology development in New Mexico. Specific causal links between successful technology and content integration by teachers with student achievements are shown. The examples include quantitative data about how teachers increased use of technologies and how they altered what their students did in the classroom. This report details purposes of the supporters and the teachers. The

authors outline the funding resources and explain methods they chose, such as raising pertinent expectations and enforcing the most impacting state policies. Some of these policies include training, use of E-rate funding, more use of data-driven assessments for decision making, and their future plans for the educators. The RETA plans to continue funding additional workshops, support for the educator, network teams, and developing cadres to meet needs in rural areas. Numerous situations in New Mexico regarding student populations are poignant and pressing. For example, in many rural or underprivileged areas there previously has been a lack of funds, equipment or dedicated professionals. RETA data supports the demonstrations of improved instructional practices and positive impact on curriculum collections. They identified statistically significant data with surveys that tally findings where content and standards are integrated with technology. Teachers changed what they did in the classrooms; they altered what students did in classrooms, and tallied what technologies were used and the ranges of expertise.

This report could be used by any district Informational Technology (IT) department to inspire focused training and cooperative communications. Many charts, tables and graphs included quantify the developments and implementations. Testimonials by individuals qualify the project. One teacher describes that she experienced tremendous growth as a professional. She now implements many technologies for her students. She provides workshops onsite, in her district, and beyond to state wide trainings. The appendices include blank generic forms and surveys used for interviews and observations.

In an age where technology is so vital, this RETA New Mexico program outlines dynamic use of funding translating to student achievement. The teachers are the vital

transmitters. The focused development trainings have great impact for the end users, all of our students, not just some.

We see then that it is humans, well trained and developed, who bridge the divide. The following report discusses gender issues as one of the aspects of the digital divide. The American Association of University Women (AAUW) Educational Foundation makes a major contribution to available research in "Tech-Savvy" (AAUW, 2000). This long range ten year plan addresses more appropriate inclusion of girls in educational technology. The Foundation reports their findings to state concerns and offer recommendations. They are working toward a large goal of resolving inequities and transforming the entire computer culture in which we live and work. Several concerns are quantified in this report like:

- Gender issues and stereotyping in computer classes
- Teacher concerns about and problems with infusion of computers across curriculums
- Statistics about girl's participation from the point of view of education, economics, and culture, and the *ways* in which they participate.

AAUW recommends redefining computer literacy. They outline and explain that more appropriate uses of problem solving be developed. Teachers need opportunities to design instruction for more innovative, dynamic learning. This learning should be more relevant to content and the student's own interests. Entry points such as math, science, art should be expanded to enable greater fluency with informational technologies. They record and document current perceptions of girls and women in technology. They find these ideas need revision, such as girls enrolling in computer clubs and computer science courses. The media can help better define computer professions and roles of women through the use of

more honest and varied reporting. Increased focus on the social purposes of computers should be emphasized rather than specific technical advances. Girls and women need empowerment to be designers, not just end users. The authors define the development that will bring about technology rich classrooms. Additional solutions include disseminating exemplary cases of equity and implementation, encouraging innovative course design and providing opportunity for reflection. Showing teachers tangible benefits and communicating classroom dynamics strategies will also help considerably. More consciousness-raising communication is required to improve public and student awareness regarding gender equity. Marketing of jobs should more accurately and positively reflect careers that need candidates who are fluent in technologies. There also needs to be more focus on non-college bound women. AAUW also explains how software development is biased and what specific changes would make favorable impacts. They advocate not "girls games" or "boys games" but rather classroom and home games that utilize ten specific criteria. These include being personable, challenging, allowing creations, multi-faceted, offering collaborative functions and being non-violent.

This report is organized in chapters for major concerns. Each issue is dealt with in a concise manner, presenting both the statistics and the motivating narratives. Multiple solutions are given immediately at each chapter ending. This is just the beginning of findings and recommendations from this agency. These AAUW solutions offer to the educator ways to implement strategies, improve instruction, balance needs of subject content with technology, and diminish the gender equity divide at their site.

While humans are the paramount element, support with training mandatory, and gender issues a major concern, "Multicultural Education and the Internet" (Gorsky, 2004)

addresses many cultural aspects of technology users. The author describes his document as "Tools, Resources, and Commentary". Gorski offers a list of links which have turned into a collection of resources and interactive forums. Since a variety of cultures are represented in our classrooms, this needful guide models a critical approach of internet resources. Asking and answering important questions, such as "what is already available and how good or reliable is it?" is a primary focus. A lengthy list of links is provided to find new opportunities in interactive learning, strategies, connections, websites and functional resources. Also listed are various contacts and dialogues, site indexes or discussions. Gorski gives useful insights on *assessment* of sites and link pages. He provides a detailed criteria table which is useful to assess web resources. The table includes categories such as relevance, credibility, accuracy, etc. His listings focus on *multicultural* and *educational*. His related sites www.edchange.org/multicultural and www.mhhe.com/multicultural are still growing. Gorski not only publishes this information freely online but also considers site names with descriptions that are submitted to him. When educators can access these models and connections, they become further empowered to increase classroom effectiveness. This resource ties pieces together for educators to grow, change, and increase effective technology use in the realm of multicultural issues.

To meet the many needs of modern learning communities in a technology rich society, it is possible to study and apply various methodologies. The research findings of the last decade have specialized for educators. For example, many scenarios have been tested to find the best learning strategies for English learners. To train educators to generate more focused and effective coursework, Wiggins and McTighe (1998) publish and train people in "Understanding By Design". Another famous teacher training is the Intel "Teach

to the Future" program. The Intel classes are aimed at solving needs for teachers to learn mainstream software and how to apply them in educational settings. Common among these training courses are cycles of new learning problems, new solutions, application of them, and then reflection of results. Found in *Educational Technology & Society* is an article explaining a framework to improve teacher training. In "Teacher Training as Collaborative Problem Solving," Barojas (2004) details a learning cycle named with the acronym TADIR. The "T" stands for Translation and means to describe given elements. The "A" is for Analysis meaning naming explicit factors involved. The "D" stands for Design or determining the main concepts of solutions. The "I" is for Implementation meaning monitoring and controlling application of the solutions. The "R" stands for Review or reflection.

When using the Barojas TADIR cycle for training, great care is to be made defining and understanding each step in the process. That way the real life goals can be actualized. For example, a learning community may desire to improve and increase technology uses. This group can follow TADIR to detail the specific needs, solutions and evaluations to be implemented. Barojas uses theoretical language to articulate the message into generic form. Consider TADIR similar to action learning which is defined by McGill and Beaty (2001) as learning by action and reflection. This is both cognitive and metacognitive. Barojas also relates TADIR to collaborative work defined by Teasley and Roschelle (1993) as humans negotiating and sharing meanings and problem solving tasks. Put into practical use TADIR can be beneficial since districts and sites each have their own unique problems regarding implementing technologies and bridging the digital divide.

The referenced articles are very specific, insightful and informative. They offer research data, instruction, resources and inspirations to meet increasing and urgent requirements. Found in each document, the humans take the lead, both as provider and beneficiary. All the authors' writings assist maneuvering the information highway and current educational circumstances. Educators are affirmed as the bridges over the digital divide. By using these resources, it is possible to increase gender equity, meet cultural requirements, and provide effective training. Interestingly the very technologies which are creating the needs are also delivering many solutions.

"My business is not to remake myself, but to make the absolute best of what God made." Robert Browning

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